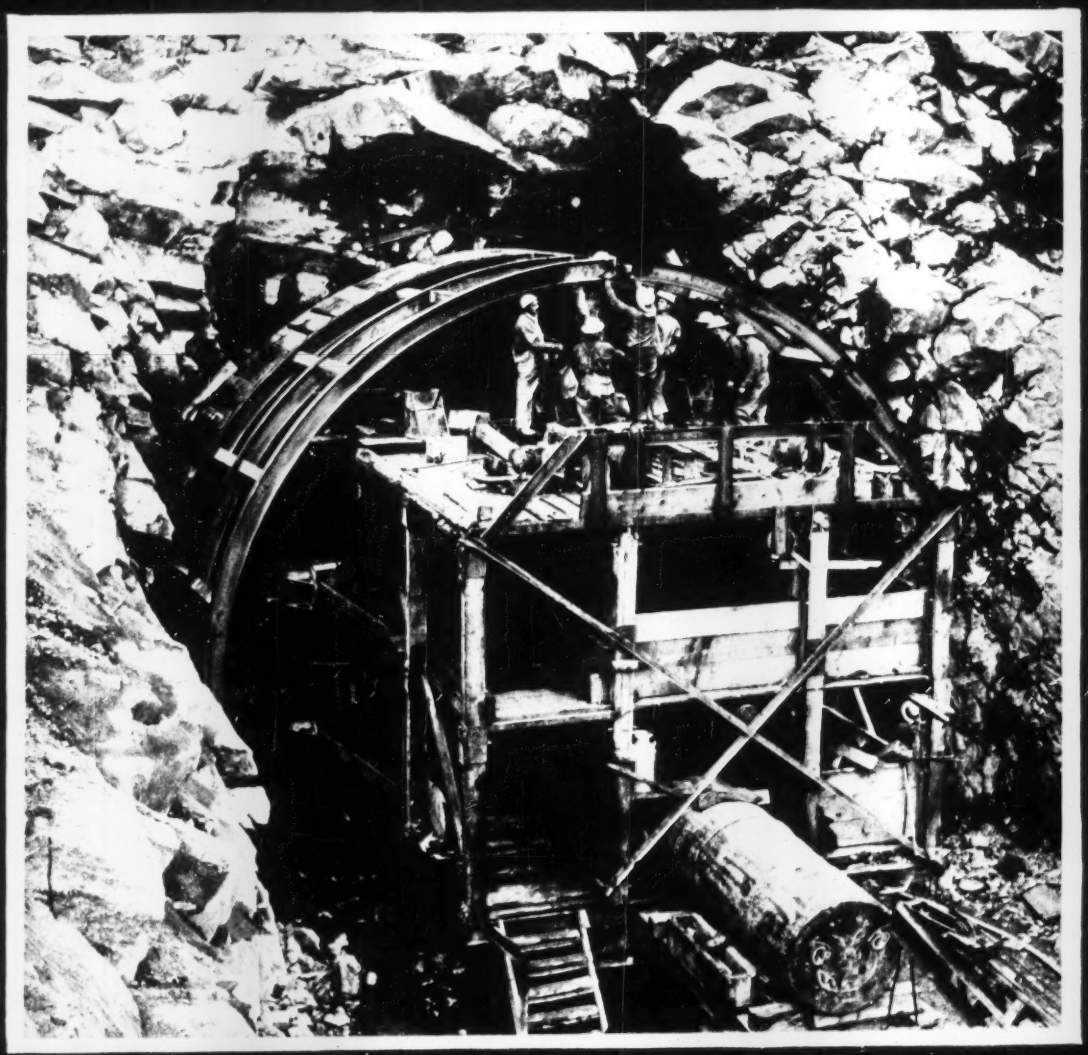
ENGINEERING NEWS-RECORD



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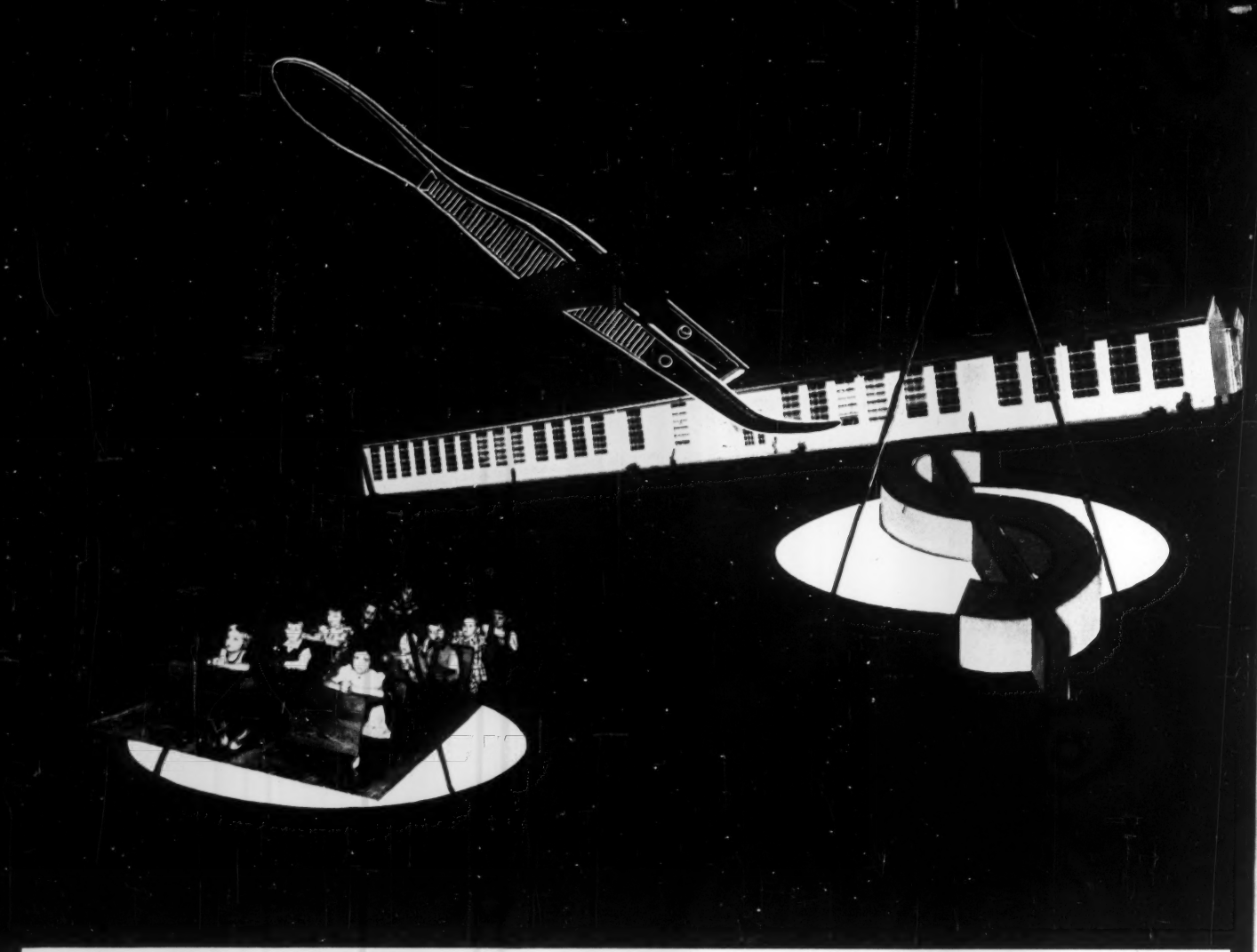

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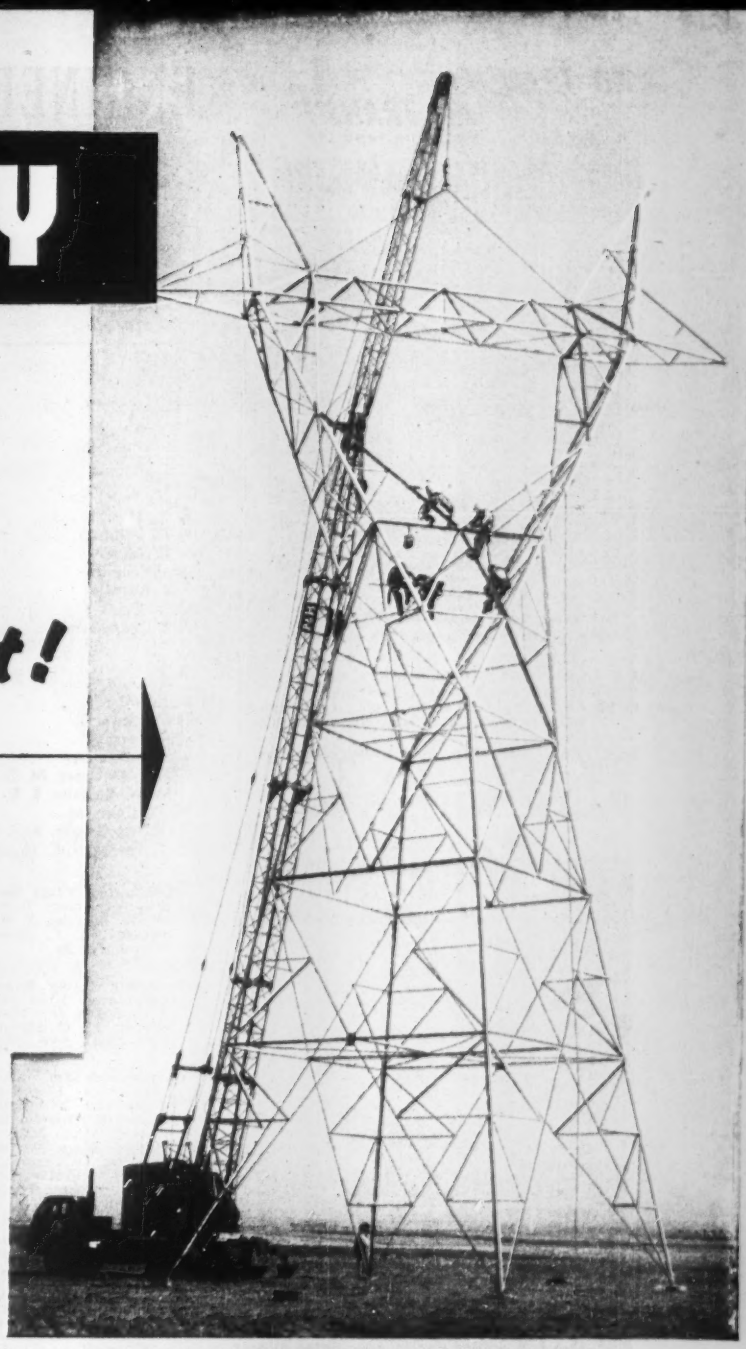

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"Whether you're assembling toasters or bridges," Ken went on, *"it pays to set your sights on fasteners."*

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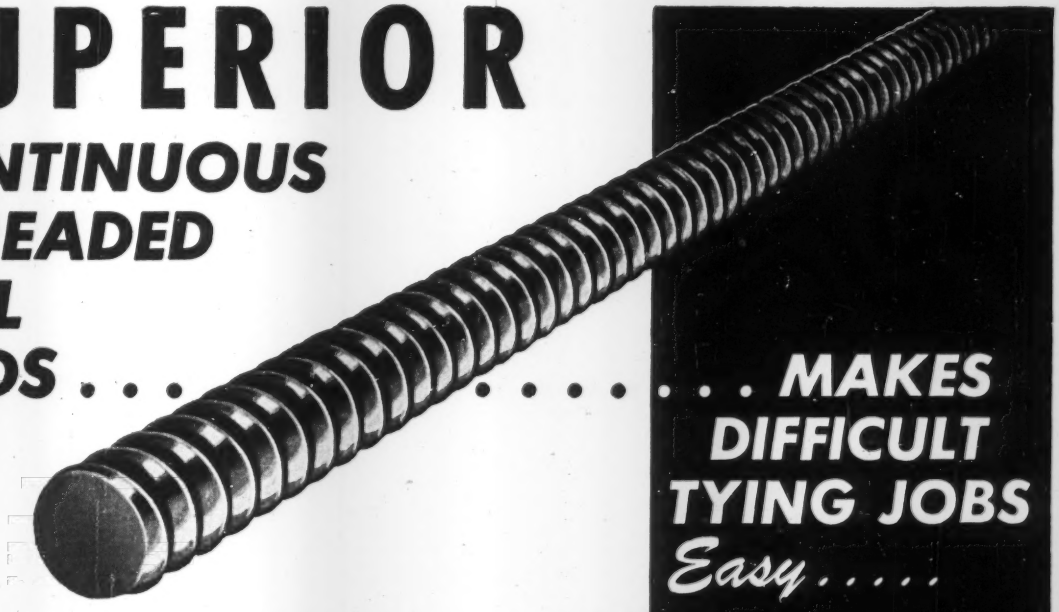

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Superior Continuous Threaded Coil Rods, with or without Coil Wing Nuts and Corner Brackets, are a valuable supplement to Superior Coil Ties and standard working parts when job conditions are unusual or difficult.

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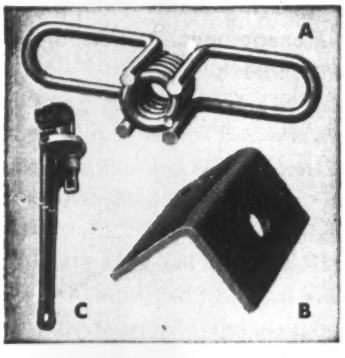

A-COIL WING NUTS
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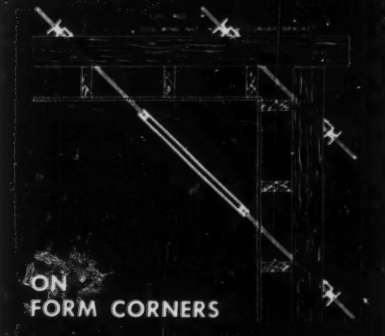
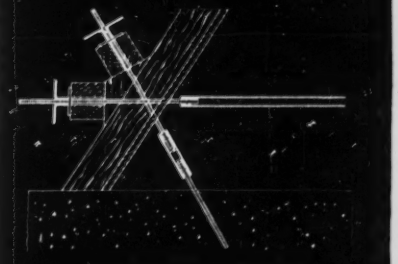
B-CORNER BRACKET
An *exclusive* Superior feature. Provides simple, efficient method of tying form corners and bulkheads.

C-SPECIAL COIL ROD WRENCH
Heavy-duty Stillson type wrench with special jaws for gripping and turning Coil Rods with least damage to threads.



ON FORM CORNERS



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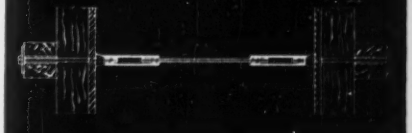

AS AN INTERNAL TIE
Two Coil Ties and a length of Coil Rod make an adjustable form tie and spreader.

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FOR the real lowdown on how Texaco Lubricants and Texaco Lubrication Engineering Service simplify upkeep, talk to equipment maintenance men. At Folsom Dam, for instance, you'll hear reports like these —

"We're getting extra long life from chassis parts in our trucks, tractors, 'dozers and other equipment. *Texaco Marfak* gives the best protection against wear and rust of any lubricant we ever used — stays on the job in spite of heavy loads, jolts, dust and mud.

"Everything said about *Texaco Marfak* also goes for *Texaco Marfak Heavy Duty* in wheel bearings. And we like the fact that no seasonal change is necessary.

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See newspaper for
time and station.

TEXACO

TEXACO

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"Texaco Track Roll Lubricant is giving us longer-than-ever service from our rollers — and they really take a beating."

Those are just three of the six basic Texaco Lubricants needed to serve all major construction equipment. Ask your Texaco Lubrication Engineer about the Texaco Simplified Lubrication Plan and how it can help you avoid mistakes, save time and money.

Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

FOLSOM DAM

Folsom, California — said to be the world's largest earthfill and concrete structure of its kind — is scheduled for completion late in 1954. To meet this date, innumerable pieces of construction equipment must be kept working at top efficiency. Effective lubrication—*Texaco*—is one of the contractor's biggest helps.

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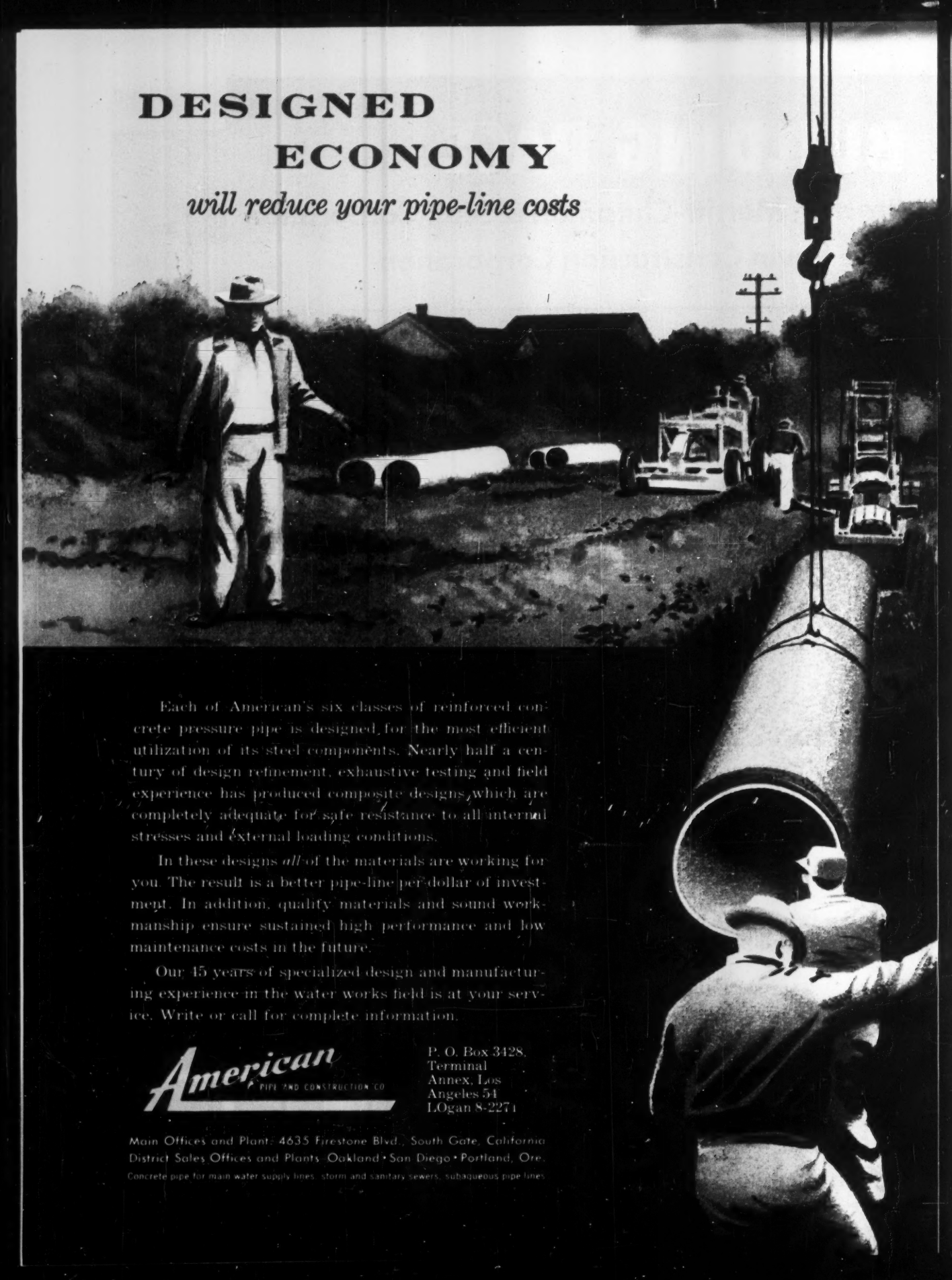

Each of American's six classes of reinforced concrete pressure pipe is designed for the most efficient utilization of its steel components. Nearly half a century of design refinement, exhaustive testing and field experience has produced composite designs which are completely adequate for safe resistance to all internal stresses and external loading conditions.

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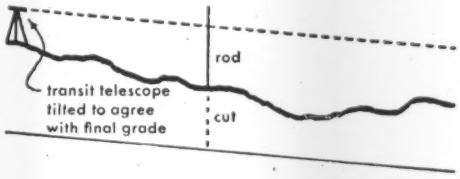
FROM THE GURLEY MAILBAG:

A few tips on better instrument operation

—suggested by readers of "The Surveyor's Notebook"



On a light grade, the telescope on the level can be tilted to set such a grade, by using your leveling screws. *(This tip, illustrated above, has been sent in more frequently than any other to "The Surveyor's Notebook.")*

*

A hand level is very useful for checking instrument set-up elevation, particularly on steep grades.

*

When leveling, it is a good idea to have a pair of leveling screws oriented in the direction of the run. Any slight re-leveling can then be done with only one pair of leveling screws.

*

In making a sidehill set-up, the bottom plate can be kept nearly level by placing two legs downhill and one uphill. As a further suggestion, some engineers add one extension leg to their stiff-legged tripod to ease adjustment.

*

To be certain that all backlash has been taken out of upper or lower tangent and spring, lightly tap the edge of the plate with the index finger when making a setting.

*

Since the telescope level is usually about three times as sensitive as the plate level, it is suggested that the telescope level be used for accurate leveling of the transit.

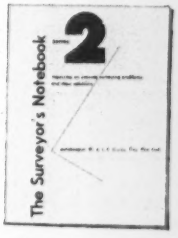
A freshly chalked string appears to "shine" when sighted under conditions of hazy lighting, and is said to be more easily seen through a telescope than is a new white line. It is a good trick for use in heavy woods, on long sights against clothes of neutral hues or under other difficult conditions. Chalk can be given to each man carrying a plumb bob, with instructions to chalk the plumb line each morning.

*

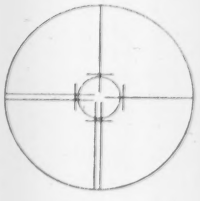
It is suggested that the telescope be used in the inverted position frequently to avoid uneven axle bearing wear.

* * *

"The Surveyor's Notebook" *collection is packed with many valuable field tips like these—plus unusual surveying problems and their solutions. More than 37,000 engineers and surveyors are finding these reports helpful. Write for your free copy of Series 2.*



Gurley suggests...Covered Glass Reticles on Gurley transits and levels. You will be able to clean your reticle without the danger of destroying the fine lines. With the Gurley Covered Glass Reticle, any dust which may drop on the surface of the glass will not be in the focal plane of the crosslines. There can be no effect of a "spotted" reticle. *See your dealer, or write directly to Gurley for further details.*



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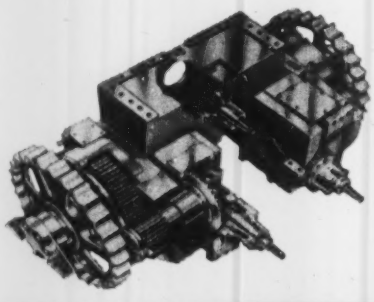
THE EIMCO 105 FINAL DRIVE

Eimco's final drive assembly is just one of the new and exclusive features of the new Eimco 105. The Eimco final drive is a rugged heavy-duty assembly made of heavy alloy steel shafts and gears and encased in heavy alloy steel cast housings. The design permits easy access to gearing through side plates. The anti-friction bearings are assembled in cages for perfect fits and longer life.

Notice the absence of troublesome clutches, brakes and gadgets in this sturdy assembly.



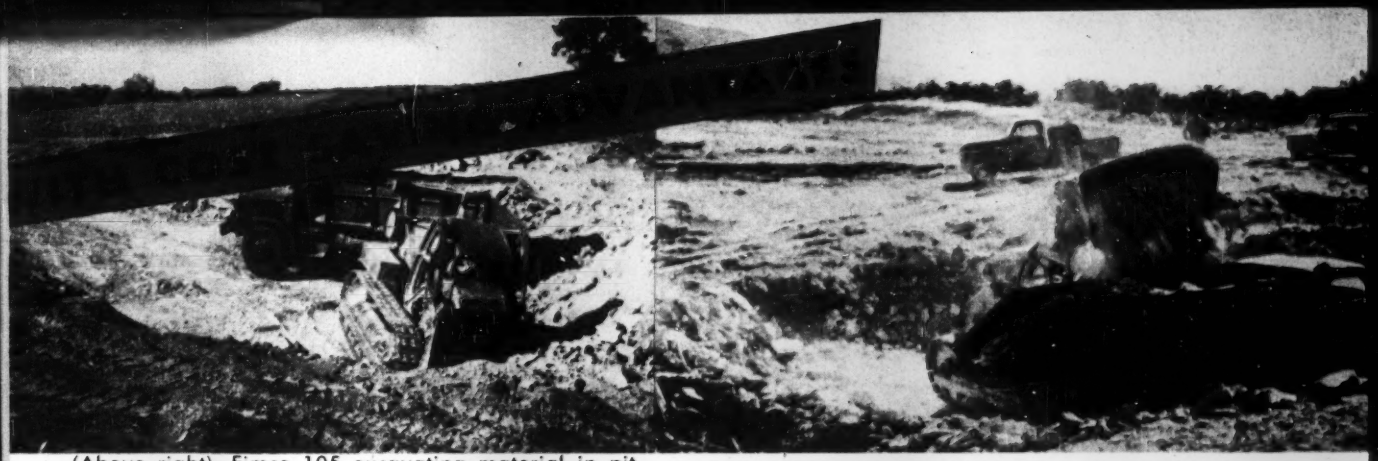
Eimco 105 Tractor Excavator is a new heavy-duty machine, thoroughly tested in the field, with all desirable features for a modern prime mover.

The 105 is a complete departure from ordinary tractor design in appearance and arrangement. The design features permit stronger construction, easier service when necessary and many other operating advantages such as:

1. Freedom from "leveritis" on the pulling and pushing of numerous hand levers, foot clutches, hand brake levers for steering and the necessity of stopping to change speeds or directions. With the 105 you use two small levers (one for each track) that can be held by one hand to give you forward motion — instant reverse or any degree of turn from "spin" turn to "feathered" turn. You can move the speed changing lever from one position to another while in motion under full load.

2. Full track oscillation even with attachments such as the Eimco loader.

3. Controlled loading speed through the Eimco two-speed bucket discharge mechanism. Easy light truck loading in low speed.



(Above right): Eimco 105 excavating material in pit with uneven bottom. This type of digging and loading is impossible with any other economical type equipment. (Above left): Fast moving 105 backs across to place bucket full of rock in truck which is parked on even spot in pit. (Below): The Eimco 105 can load trucks or railroad cars up to 11 ft. high. Average loading speed is 6 - 10 yards per minute in rock. Illustration on opposite page: The Eimco 105 shown here is loading a large truck from the end on a grade of approximately 20%. Two speed loading mechanism (exclusive on Eimcos) permits throwing load all the way back in this type of loading.

B-3

4. Complete visibility with the operator well up front where he can see what's going on.

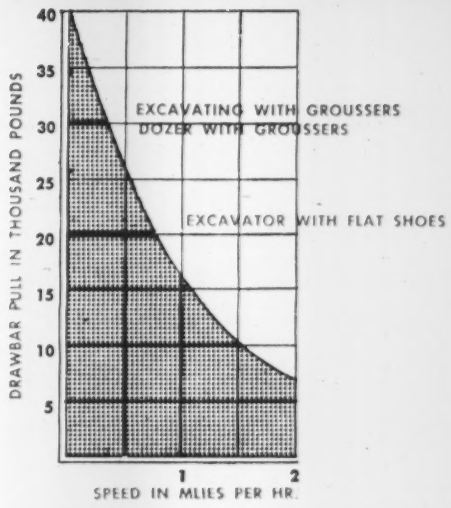
5. Greater production because of its easy handling and greater maneuverability.

6. Clutches never require adjustment.

Dependable operation is always a feature of Eimco equipment and in this the Eimco 105 is no exception. We have tried this machine under operating conditions where in a few short hours it has been subjected to more abuse than a high speed contractor can deal out in a month. The 105 can take it.

This rugged construction of the 105 was carefully planned. Every part has been designed for strength. Castings are all alloy steel. Wearing parts have been very carefully heat-treated. Machining tolerances have been held to rigid standards.

In addition to this, new designs have been incorporated in many of the individual pieces in order to give them greater strength, easier accessibility and in many cases to assure many years of operation with absolutely no attention except normal lubrication.



Drawbar pull charts based on preliminary tests showing relative comparisons.

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the job's a snap...with a snap-joint

Here's the newest development in Mechanical Pipe Couplings—the Victaulic Snap-Joint *boltless toggle* pipe coupling.

The Snap-Joint extends the Victaulic Method into usages where speed and frequent dis-assembly and re-assembly are controlling factors. Snap-Joints assemble over the pipe ends in a matter of seconds with a speedy hand-lock . . . no wrenches required.

Snap-Joints, made to supplement Victaulic's famous line of bolted couplings, are ideal for temporary lines, valve, meter and pump connections and similar uses . . . their strength and durability make them completely reliable for permanent installations.

Snap-Joints fit Victaulic grooved pipe and the complete line of Victaulic Pipe Fittings . . . Ells, Tees, Reducers, Caps, etc. Every joint serves as a pipe union.

New Victaulic Snap-Joints are ready for your next job through all Victaulic Stocking Supply Houses. Available in pipe sizes: 1", 1¼", 2", 3" and 4". They are part of the world famous *complete* Victaulic Method of Piping.

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READER COMMENT

Q equaled AV in 100 B.C.

SIR: Nobody can ignore the considerable scientific contribution of the ancient Greeks. Study of rescued texts from their day sheds new light on the influence of their thinking on progress and the high level of today's civilization.

We can now be sure that the Greek hydraulicians of the second century before Christ knew and used the fundamental law of flow and the volumeter method of measuring discharge.

In hydraulics, rate of flow or discharge is expressed $Q = AV$, where A is the wetted cross-sectional area and V is the mean velocity of flowing liquid. This is the fundamental law of flow.

Who first expressed it? When was it formulated?

Today's books generally don't say. Prof. H. Hughes of Harvard University, in a treatise on hydraulics said "The Benedictine Castelli (1577-1644), a pupil of Galileo, probably was the first clearly to understand that discharge depended upon both velocity and cross section . . ."

Indeed, the Italian monk of St. Benedict did introduce velocity of flow as an element with the cross-sectional area to compute discharge. This is indicated in his treatise "Della Misura Della Aqua Corranti" (About the Measurement of Flowing Waters), issued in Rome and long considered a classical book on hydraulics. In 1664 this book was translated into French and many formed the opinion that Castelli probably was the first to understand that discharge is determined both by cross section and velocity, and that he had composed the fundamental law of flow.

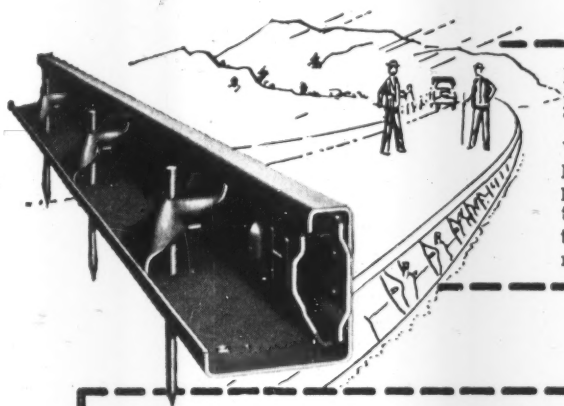
However, writings of the Greek, Heron of Alexandreus, on mechanics and hydraulics in the second century B.C. indicate good knowledge not only of hydrostatics but of hydrodynamics and hydrometry. Heron of Alexandreus was known as Heron the Metric or Heron the Engineer. In his "Treatise", as he calls his last book, Heron wrote an example in Greek that freely translates (in part) into English as follows:

"For a given source compute its discharge . . . Make a piece of lead pipe of quadrangular cross section, computing its dimensions . . . Fit it in a manner that the outflow of source will take place through it. . . Let water flow with a depth of 2 ft (the ancient foot equalled 1.85 cm.

(Continued on page 14)

Here's How Leading Contractors Put an End to their Form Problems..

Here's the widest selection of steel forms available today. For more than 40 years, Heltzel has designed and built more types of forms than any other manufacturer. In fact, many form styles in general use today were developed by Heltzel engineers, who are constantly revising and improving their products to give you modern equipment that will do a better job faster.



Here's why the Heltzel Highway Form is so popular: It's extremely easy to set and align — The flanged base means extra strength — All welded construction and "Special Analysis" prime carbon steel make it tougher — It has a positive lock that really supports and transfers the load — The extra wide tread gives greater traction — Helco stakes made from rerolled rail material are the toughest.

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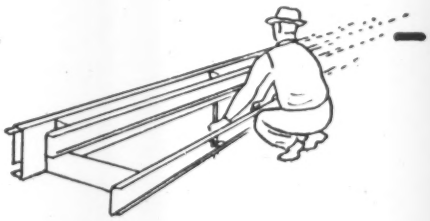

Heltzel Curb and Gutter Forms are the quickest-setting available — Light in weight, yet rigid in construction, they are made to required specifications. A single set of forms can be made adaptable to a variety of curb and gutter combinations. Flexible and rigid radius forms can be made to match.

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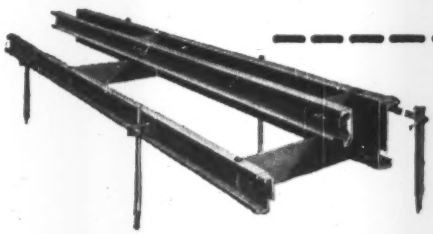

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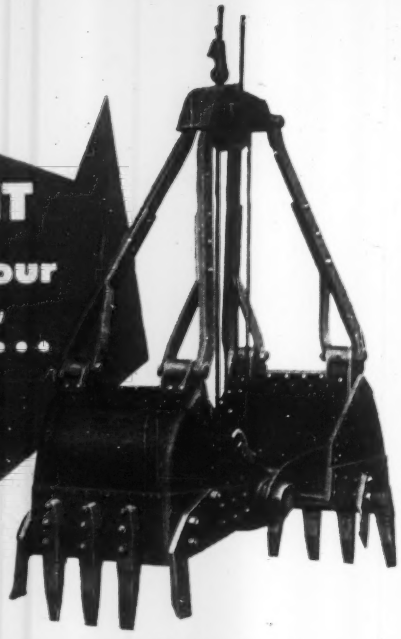

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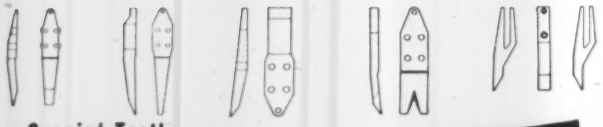
Side cutting teeth

A bucket of recognized ability becomes a greatly improved "digger" when equipped with teeth of proper type and design.

Owen Buckets are designed to utilize the weight of the bucket to force the teeth into the material when dropped contributing to their reputation as exceptionally efficient digging buckets.

Owen teeth are designed especially for "deep penetration"—teeth that "grasp and hold"—teeth for "breaking down resistance at corners" to aid shell penetration—side teeth "to cut wall clearance" in trench excavation, etc.



Special Teeth

BUCKETS AND GRAPPLES

Write for Catalog

THE OWEN BUCKET CO.

READER COMMENT

while the foot today is about 30 cm) and the width is 6 ft. . . Then 2x6 = 12, we say that the capacity of the source equals to 12 ft. Except we must note that it is not enough . . . to find the flowing volume for which we say that is equal to 12 ft, but its velocity, too. . . When velocity is greater the source gives more water since when it is smaller it gives less. . . For this reason . . . we must install . . . a basin and by use of a sun dial find the flow per day."

From this text we are led to conclude Heron was the first man in the world to define the factors of discharge of a stream—cross-sectional area and velocity. He also defined their relationship.

We propose to call the equation $Q = AV$ the "Formula of Heron of Alexandreus" or fundamental law of flow by Heron of Alexandreus. Also, the method of measurement of discharge by volumetric vessels we propose to call the method of discharge measurement by Heron of Alexandreus.

P. Argyropoulos
Chief, Bureau for Hydraulic Research
Ministry of Public Works
Athens, Greece

CALENDAR

American Road Builders Association, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., Jan. 5-7.
National Constructors Association, annual meeting, Hotel Commodore, N. Y. City, Jan. 12-14.
Highway Research Board, annual meeting, National Academy of Sciences Building, Washington, D. C., Jan. 12-15.
National Association of Home Builders, annual convention and exposition, Conrad Hilton and Sherman hotels, Chicago, Jan. 17-21.
N. Y. Section AWWA, winter luncheon meeting, Commodore Hotel, N. Y. City, Jan. 19.
Land surveyors conference and exhibition, University Commons, Rutgers University, New Brunswick, N. J., Jan. 23.
Mason Contractors' Association of America, Sherman Hotel, Chicago, Jan. 24-27.
Conference on Prestressed Concrete, University of Toronto, Toronto, Ont., Jan. 28-29.
Associated Equipment Distributors, Waldorf Astoria Hotel, N. Y. City, Jan. 31-Feb. 4.
Association of Asphalt Paving Technologists, Kentucky Hotel, Louisville, Ky., Feb. 1-3.
Ohio Water Clinic Conference, Ohio State University, Feb. 11-12.
California Industrial Safety Conference, Palace Hotel, San Francisco, Feb. 11-12.
N. J. section American Water Works Association, winter meeting, Essex House, Newark, N. J., Feb. 16.
American Society of Civil Engineers, spring meeting, Atlanta Biltmore Hotel, Atlanta, Ga., Feb. 17-19.
Northwest conference on road building, University of Washington, Seattle, Feb. 17-19.
Golden Anniversary Convention, American Concrete Institute, Shirley-Savoy Hotel, Denver, Colo., Feb. 22-25.
American Concrete Agricultural Pipe Association, Fairmont Hotel, San Francisco, Calif., Feb. 24.
American Concrete Pipe Association, annual convention, Fairmont Hotel, San Francisco, Calif., Feb. 25-27.

More Hydro Power from Osage

The design and construction of the initial installation of the Osage Hydroelectric Development, comprising six units of 23,887 kva each, was completed by Stone & Webster Engineering Corporation in 1931.

To provide additional power to meet the system's growing requirements, and following an engineering analysis by the engineers of Union Electric Company of Missouri, decision was reached in 1951 to employ Stone & Webster Engineering Corporation to install two additional units of 23,887 kva each, bringing the total capacity of Osage to 191,096 kva.

STONE & WEBSTER ENGINEERING CORPORATION

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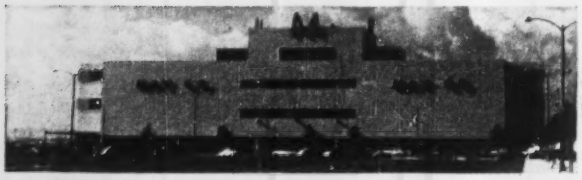
Coast to coast...Ryerson re-bars

Meet Construction Schedules

From Boston to Los Angeles, leading contractors depend on Ryerson for on-time deliveries of fabricated reinforcing steel and related products.

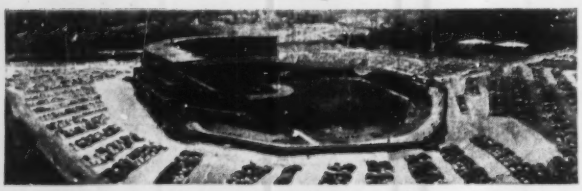
A few recent projects on which Ryerson supplied the steel are shown here. Their size, variety and widespread sites point up the fact that Ryerson can handle any type of job in almost any location. Re-bars are accurately cut and bent. Metal tags that won't blur or tear make identification easy. And to simplify purchasing *all* steel requirements can be ordered from one source.

On your next job contact Ryerson for a lump sum or average pound price.

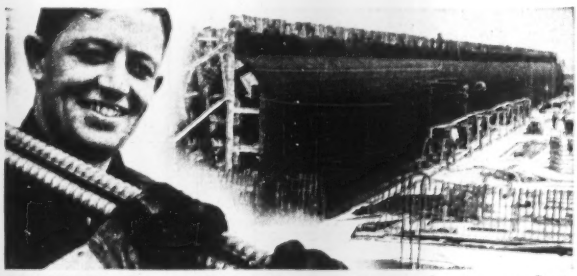


LOS ANGELES—T. S. Construction Engineers built this new May Co. department store—with the help of on-time deliveries of re-bars from Ryerson.

BOSTON—Gust K. Newberg Construction Co. was contractor for this new 1000-bed veterans hospital at Brockton, Mass. Ryerson supplied 4,000 tons of reinforcing steel for the project.

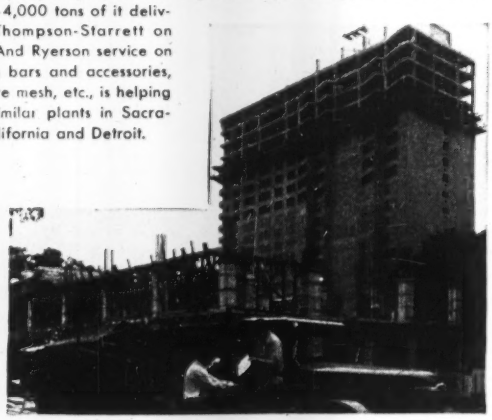


MILWAUKEE—In building the Milwaukee County Stadium (home of the Braves) Hunsinger Construction Co. played safe—ordered fabricated re-bars from Ryerson.



BROOKLYN—Thompson-Starrett Co. was contractor for the vast Owl's Head sewage treatment plant (shown here during construction) which will have a daily capacity of 160 million gallons. Ryerson supplied the reinforcing steel—4,000 tons of it delivered to Thompson-Starrett on schedule. And Ryerson service on reinforcing bars and accessories, spirals, wire mesh, etc., is helping to build similar plants in Sacramento, California and Detroit.

BUFFALO—Bates and Rogers Construction Co. depended on Ryerson for the reinforcing steel needed to carry a new elevated highway over waterways and industrial congestion. More than 2,000 tons of fabricated re-bars were delivered when needed.



CHICAGO—Neighboring multi-story apartments rise on Chicago's lake front with the help of dependable Ryerson steel deliveries. For the building in foreground contractors were: Crane Construction Co. and Carl E. Erickson Co. For building in background: Sumner S. Sollitt Construction Co.

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THE CONSTRUCTION WEEK

THRUWAY GO-ROUND—New York State's Thruway Authority and one of its contractors are well embarked on as merry a legal tangle as could be wished for in a holiday week. The tie-up involves two sections of the thruway, one north and one south of the city of Yonkers, and in one case the contractor is suing the authority, and in the other, the authority and the same contractor have been stymied by a public suit.

Trouble started on a $12-million thruway section north from Yonkers to Tarrytown. Original bid date of Oct. 1 was postponed to Nov. 5. On that date, Yonkers Contracting Co. submitted the only bid on the section—to be told verbally by the state's contracting officer that bids had been postponed further, because of a needed clarification of specifications. Attorneys for the contractor contended that the authority could not cancel a call for bids verbally, and thus should open Yonkers company's tender. That case is now before the State Supreme Court.

Meanwhile, the authority last week opened bids on a controversial thruway section south of Yonkers—and low bidder on $3 million of it was Yonkers Contracting Co. Location of this section was upheld in court only this week, thus holding up contract award.

ATOMS—PRIVATE OR PUBLIC?—One sign that private-public power competition will move right into the nuclear field can be read into the announcement that Tennessee Valley Authority and Atomic Energy Commission have signed agreements for feasibility studies on commercial nuclear power.

TVA thus becomes the first public power agency to enter the field, though six private industry groups already are engaged in such study.

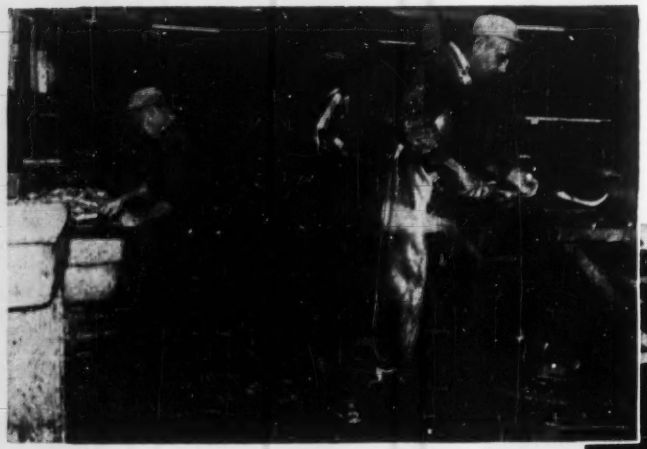
ADDITIVES UP AGAIN—The Federal Trade Commission got back into the controversy over battery additives (to prolong battery life). It reopened its study of AD-X2.

FTC had dropped the investigation as to the truth of claims made by manufacturer, after a congressional controversy started over role of National Bureau of Standards in the matter (ENR Jan. 22, p. 96).

PUMPED POWER FOR N. Y.?—The newly formed Energy Accumulation & Exchange Corp. of New York City has filed a declaration of intent with the Federal Power Commission to construct a $60-million, pumped-storage power project in Chautauqua County, N. Y.

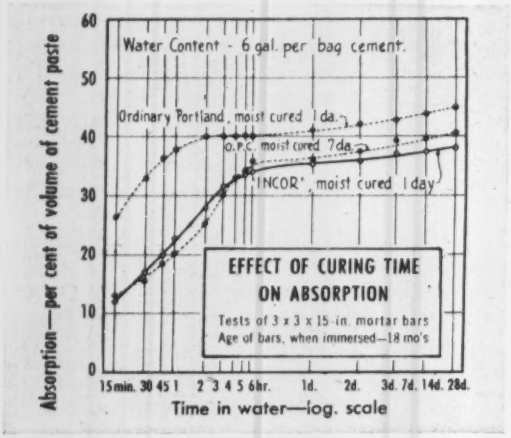
The plan is to dam off an upland valley, use turbine pumps to run water into a lake that would develop more than 750 ft of head (using purchased off-peak thermal power); then run the water back through the same five turbines to produce a peak capacity of 400,000 kw. Backers told FPC that local utilities in a 120 mi area would buy the peak power.

NOTHING "FISHY" about 17-Year 'Incor' Performance in this Heavy-Duty Concrete Floor



'INCOR' FLOOR in Atlantic Coast Fisheries' plant, Provincetown, Mass., built in 1936, gets the full treatment . . . iron-wheeled trucks loaded with 1000 lbs. of fish, floor cleaned nightly with live steam, then washed down. Condition survey shows floor in first-class condition after 17 years' wear and tear . . . no maintenance expense, no leakage into cork insulation of freezing room below . . . typical 'Incor' performance.

Concrete with 'Incor' for *EXTRA* Durability and Wear-Resistance


Absorption—per cent of volume of cement paste
60
50
40
30
20
10
0
Water Content - 6 gal. per bag cement.
Ordinary Portland, moist cured 1 da.
O.P.C. moist cured 7 da.
"INCOR", moist cured 1 day
EFFECT OF CURING TIME ON ABSORPTION
Tests of 3 x 3 x 15-in. mortar bars
Age of bars, when immersed—18 mo's
15 min. 30 45 1 2 3 4 5 6 hr. 1d. 2d. 3d. 7d. 14d. 28d.
Time in water—log. scale

Dependable 'Incor' high early strength means a floor ready to use 24 hours after placing. Fast, thorough curing in the short time concrete can be kept wet on most jobs assures greater strength and wear-resistance . . . watertightness and less absorption, too. 'Incor' cured one day has less absorption than ordinary portland cement cured 7 days.

● Spilled loads, trucking delays, under-foot hazards are costly. You can rebuild worn-out floors over a week-end with 'Incor' 24-Hour Cement. Dependable 'Incor'* high early strength means a floor ready to use 24 hours after concreting.

There's no substitute for a *real* heavy-duty floor, and that means concrete, *good* concrete. By curing *thoroughly* in one day, instead of a week or more, America's *first* high early strength portland cement assures stronger, longer-lasting floors . . . lowest annual cost, through extra years of expense-free service.

Write for illustrated booklet, "Concrete Floors"—address Lone Star Cement Corporation, Room 1501, 100 Park Avenue, New York 17. *Reg. U. S. Pat. Off.

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WASHINGTON OBSERVER

Assuring continued prosperity will be the theme of Eisenhower's Jan. 4 radio-TV address to the country. It's being drafted as the "Man-in-the-Street's" State of the Union, preceding the President's Jan. 7 message to Congress. The Administration sees a good year ahead, but will promise that any dip in business will be countered with government programs to cushion it.

Tax relief will be first of any program of government aids. There are two quick sources of relief—the post-Korean boosts in corporate income taxes and excise taxes. Both are due to expire March 31—but the Treasury is appealing for both to be continued to maintain revenue. If a business turndown should come along, the Treasury could change its mind, thus letting another $3 billion a year go to companies and individuals. About $5 billion a year in tax cuts become effective on Jan. 1.

Housing and public works stand next to tax relief. Already, the Cole committee's recommendations, unofficially endorsed by Eisenhower and congressional leaders, pretty much guarantee a one-million-start year. And new dams and river and harbor projects are ready to be started next year.

•

Replacing FNMA with a private mortgage corporation (see page 54 for full discussion) is running into heavy congressional objections, as well as from home builders. Democratic opposition can be counted on as almost unanimous. Party people say that without federal participation, any secondary mortgage market would "collapse." However, savings and loan spokesmen like the idea and will push for an end to FNMA. House Banking Chairman Jesse Wolcott also approves the switchover, but Senate Chairman Capehart will go slower. Hearings on a new housing act will begin in mid-January, probably first in Capehart's Senate committee.

•

Taft-Hartley revisions suggested by Labor Secretary Mitchell will be "liberal." They will face a stiff congressional fight—perhaps even to the extent that there will be no legislation in 1954. But among the series of amendments Mitchell is sending to the White House is one to let construction unions require union membership in seven days instead of the present 30-day waiting period under the union shop.

Higher unemployment compensation pay will be pushed, along with higher minimum wage and Taft-Hartley revisions. The Administration lines these up equally with labor law changes as part of its "progressive" program that Eisenhower feels is needed to win in 1954.

•

There will be no construction industry council set up under the Commerce Department. Secretary Weeks has been plugging for such industry councils ever since he took office. But the Department of Justice, wary of antitrust implications, has turned a firm thumbs down.

Instead, one-shot industry conferences will be called by the new Business and Defense Services Administration; membership of the conference will be changed depending on the particular subjects to be discussed. At the first meeting of the construction group with Commerce officials construction officials told Lothair Teetor that the statistics of the building materials and construction division should be expanded and improved. About thirty industry officials attended the meeting.

The pioneer still leads

in 6-wheel sales for 18th straight year!

New INTERNATIONAL RF-190 Series. Proved INTERNATIONAL bogie with third differential. GVW ratings, 30,000 to 38,000 lbs. 145, 157, 175, 193, and 211-inch wheelbases. Gasoline, LPG, or diesel power.

Eighteen years ago, the first 6-wheel INTERNATIONALS were built. With them, heavy-industry and off-highway truck operators could haul bigger payloads.

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International Harvester Builds **McCORMICK**® Farm Equipment and **FARMALL**® Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

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INTERNATIONAL® TRUCKS

"Standard of the Highway"

Airfield construction outlook: Civil, uncertain—military, good

Emphasis on air power expected to step up contracts for bases—future of federal aid in doubt but cities will press for continuation of meager funds

The federal-aid civil airport program faces another lean year, but military airbase contracts should keep coming up at the current rate or better through fiscal 1955.

As the January budget message took final form last week, the outlook for airfield construction was as follows:

- Again this time, the Administration will propose no new funds to aid construction of civil airports. Congress, of course, may decide to lift the ban and even the Administration may backtrack, especially if a current Commerce Department study favors continued aid.
- Decision to place main defense reliance on the Air Force—to increase strength from 100 to 127 wings in 1956 and to 137 in 1957—indicates necessity for further airbase construction. Only the amount of money remains to be determined.

• Setp-up in airbase awards seen—Top Air Force generals will defend their construction requests at January meetings with Defense Secretary Wilson's staff. Out of those discussions will come the final decision on what part of the Air Force 1955 budget goes for airbases.

Congress will be asked to approve construction funds and projects to maintain a faster schedule of new obligations. The Air Force has not attained the high rate of contract awards at which it aimed last year.

In the fiscal year that ended June 30, new construction obligations totaled $1.2 billion. Since then the award rate has declined to an average of $60 million a month, caused mostly by review and reprograming delays.

For the big buildup ahead, however, the Defense Department and Congress almost certainly will set up backlogs to permit contract awards of $1.2 billion to $1.5 billion in fiscal 1955. A fair share of that money will go to overseas construction.

• Civil funds have lagged—For federal aid to civil airports the future is foggier. Congress last year agreed to suspend additional contract authority for federal-aid airport projects until the Commerce Department restudied the whole program. The study is not yet complete, and Congress will be asked to hold off again.

Since the federal-aid program got under way in 1947, the Civil Aeronautics Administration has paid about half the cost of $340 million worth of construction and improvements on local airports. In its annual revision this year of the national airport plan, the agency named more than 2,200 local facilities that need $600 million in improvements to take care of air traffic forecast for 1960. The CAA expects airline passenger traffic for most cities to have doubled by that year.

Congress envisaged a billion-dollar seven-year program when it authorized $500 million of federal aid in 1946. Appropriations never kept up to that schedule. Federal-aid funds available for projects in seven years add up to less than $200 million.

Halting, piecemeal approach to federal aid is one of the reasons cited by Commerce Undersecretary Robert Murray in asking a holdup on further grants. Petty driblets that are slow in coming hamper a city's attack on its airport needs, he maintains. In his view, the small share that the federal government contributes does not make or break a city airport project.

• Cities want even meager aid—But the mayors and other local officials take the opposite view. They back a national system of airports built to federal standards with government aid. Lacking federal assistance, they assert airports would be hard to finance, and interstate air traffic would be handicapped by longer delays in building adequate facilities.

Modest federal aid amounting to 10% or so of the total cost of the project has helped construction of airports at Pittsburgh, Baltimore and Philadelphia, for example. Murray says the federal contribution was not a vital factor in the decision to build these airports. But city officials counter with the argument that federal aid often makes the difference in financial feasibility.

Federal aid to the three cities ranged from $2.8 million for Pittsburgh's $35-million airport to $2.6 million for Philadelphia and $2.5 million for Baltimore. Philadelphia recently opened its $15-million terminal building with the announcement that leased space will pay for operation and maintenance, while the city takes care of amortization. Future construction, airport officials say, can be financed through long-term leases to airlines and other concessionaires.

• Projects widely distributed—Other big airports have been assisted by federal aid. Chicago plans to complete enough work on its O'Hare site to take 30% of the traffic from Midway by next summer. Midway, the world's busiest airport, is badly overloaded. The federal government has put $6.8 million into aid projects costing $18.5 million at O'Hare. Ultimate cost may run to $75 million.

Newark, N. J., Airport has received $4.8 million in federal aid. Of that amount, $800,000 went into the new instrument runway to improve safety conditions. Grants for new or im-

Airport construction contracts 1951-'53

(As reported by Engineering News-Record and Construction Daily)

	First 11 months			
	1951	1952	1953	% chge '52-'53
		millions		
Total airport construction	**$673.6**	**$587.2**	**$514.5**	**—12**
State and municipal	**47.2**	**45.4**	**40.6**	**—11**
Federal (chiefly military)	**614.7**	**520.9**	**464.2**	**—11**
Runways & taxiways	228.2	85.8	120.0	+40
Hangars, buildings	178.3	221.7	237.7	+ 7
Housing	103.4	98.0	25.6	—74
Facilities & utilities	104.8	115.4	80.9	—30
Private airports	**11.7**	**20.9**	**9.7**	**—54**

proved runways generally have been tagged for enhancing safety.

Both Atlanta and Miami have completely rebuilt their airports since the war. Atlanta has been aided with $2.7 million and Miami with a grant of $4.8 million.

At Los Angeles International Airport, a big grading job for additional runway construction has been finished and an underpass carrying parallel runways and taxiways over a main highway has been built. This airport has received $5 million of federal-aid money.

At San Francisco, field work on the International Airport is essentially complete, and a big terminal building is under way. Federal aid to this airport amounts to $5.3 million. High-altitude Stapleton Airport at Denver has lengthened its primary runway to 10,000 ft, as a federal-aid project and is developing its terminal building by stages. Federal assistance here totals $2.3 million.

Work on the St. Louis Lambert Field is pretty near complete; a new tri-dome terminal building is under construction. The federal contribution to the airport adds up to $3.1 million.

To the New York Port Authority's big Idlewild Airport, the federal contribution is $3.4 million, matched by a $4.6 million expenditure by the sponsor on the aided work. For the entire federal-aid program, the ratio of federal-sponsor matching works out to an average of about 50-50.

• **Strong support building up**—Because the small amount of federal aid has been thinly spread over the 48 states, assistance could be given only to selected projects on any large airport. But even a 10% subsidy toward the total cost of an airport is enough to win the support of city officials and aviation interests.

Congress will give some support to these interests when they plead for a revival of the aid program. And the Commerce Department is likely to find similar supporting testimony among officials within its own bailiwick.

An airport advisory panel of the department's transportation council has been studying the problem since May. Last week it submitted its report for action at the next council meeting Jan. 15.

Industry people making up the panel recommend revival of federal aid for airports in slightly modified form. They propose that aid be given to some 2,000 airports over the next six years, that new airports generally be limited to a single runway, and that no further money be allotted to terminal building construction.

Air and naval base locations in Spain, other new details of program revealed

Location of five of the U. S. air and naval bases to be constructed in Spain became known last week. Other new facts on the program also came to light in Washington with the release of testimony given recently in secret hearings before a House appropriations subcommittee.

Although no official announcement had been made at ENR's press time, Pentagon sources confirmed Spanish newspaper reports quoting Air Force Secretary Talbott as placing location of four airbases at Torrejon, near Madrid; at Alcaparra and Moron, both in the province of Seville; and at Zaragoza in northeast Spain. The naval base, according to these sources, will be near Cadiz.

It was disclosed in testimony before the House committee that about $150 million will be spent on the initial phase of the program. Ground isn't expected to be broken before May.

• **Cost outlook favorable**—Rear Adm. Joseph F. Jelley, Defense Department director of construction, reported in his testimony that the Navy had begun planning on two bases but then switched to consideration of one location (presumably Cadiz) that could serve the same objectives as the two sites originally planned. He also revealed that the Navy project will include a pipeline terminal which can be supplied by tankers. The pipeline will supply the airbases.

(Cadiz—as was noted in ENR's extensive article on the Spanish base question in its issue of May 14, 1953—would seem to be a logical spot for a naval base for strategic reasons as well as for its natural facilities. The city is west of Gibraltar on the Atlantic, and so presumably could not be cut off by submarine or air action as easily as could bases at, say, Cartagena or Barcelona, on the Mediterranean.)

Assistant Defense Secretary Franklin G. Floete testified that he expected overall cost of the first phase of the program would run about 80% of what it would cost to build the same facilities in the U. S. Reasons advanced: Construction can proceed at the most efficient rate because there will be no pressure for an early completion date; labor costs in Spain are vastly lower and Spanish labor will be used, except for a few hundred American supervisors.

• **Remembering North Africa**—Admiral Perry was questioned closely during the hearings about details of the military's control of the whole construction operation. The congressmen were concerned lest there be repetition of the adverse publicity that arose over the North African airbase construction.

At one point Admiral Perry was asked: "Are we correct in assuming that the same general pattern with respect to the relationship between the Air Force and the Navy as the construction agent will be what it was in North Africa?"

Admiral Perry replied, "No, sir; I could not operate under such a pattern. The present agreements are such that I, as the contracting officer, will have ready access to the officers whom I put over there as officers in charge of construction, and they will report directly to me on the administration of contract matters. We have absolute control over the architect-engineers and we will have absolute control over the construction firm or firms, whoever they may be. My people are the only people who can talk directly to or issue orders to the architect-engineers or the construction firms."

Carrying his point further, the admiral declared: "The master plans will be drawn first and they will be subject to approval by the Air Force. We will then follow with the detailed drawings. That also is subject to approval by the Air Force and I am speaking now only of the Air Force and not the Navy work. Once those plans are approved then the actual construction will start, and it will take rather high authority for those plans to be changed. Certainly they cannot be changed by anyone but my own representatives on the project."

Kentucky court ruling paves way for turnpike

A decision by Kentucky's Court of Appeals has put the state in the turnpike business—and cleared the way for the 40-mi, $30-million Louisville-Elizabethtown road project.

The court upheld the 1950 Toll Road Act, ruling that there is no basis for the contention that a toll road is not a public highway—"It is owned by the state and is open to public travel." Maintenance of public highways, according to the court decision, has been recognized as a government obligation for so long that it closely approaches the character of an essential government function—one that the government has an inherent duty to perform.

Construction of the turnpike is expected to start by June. Meanwhile, the highway department will sell revenue bonds to finance the project.

Firm must make good on defective road job

A St. Paul contractor has been ordered to repave a five-mile stretch of Minnesota state highway, as a result of investigations that disclosed that there was a deficiency of 3,919 barrels of cement in the concrete paving (ENR Dec. 17, p. 24).

State Highway Commissioner Michael J. Hoffmann, in ordering Okes Construction Co. to make good on the five miles of defective paving, postponed their work until after the winter months but specified that it must be started by June 15 or the state would do it at the firm's expense. He said the firm will receive no additional money, beyond the $340,000 already paid on its $670,000 nine-mile road contract, until the repaving is done.

Hoffmann explained that the state was taking over the defective stretch of highway, despite "breach of contract" by the Okes firm, in order to open a route for travel in the winter months. The commissioner said the roadway will be opened to traffic just as soon as accumulated ice can be removed.

The nine-mile paving project between Taylors Falls and Center City was completed by the Okes firm in August. The rejected section is between Taylors Falls and Shafer.

Action on Delaware

Solution to tri-state water rights issue is aided by New Jersey legislation

New Jersey's legislature in special session last week passed a bill designed to remove Pennsylvania opposition to a petition before the U. S. Supreme Court that would give New York City 360 mgd more water from the Delaware River.

The measure evolved from pre-trial conferences the Supreme Court master has held with engineers and attorneys from the three states (ENR June 25, p. 27). It repeals a 1783 New Jersey law forbidding construction of dams along the N. J.-Pa. border and thus clears the way for Pennsylvania to build on the Delaware for water storage, if that should be deemed desirable at any future time.

For this concession, New Jersey is assured the right to continue the present diversion of 100 mgd from the Delaware River through the Delaware and Raritan Canal.

And for the right to increase its diversion of Delaware water from 440 mgd to 800 mgd, New York City has set forth a new "Montague" formula for releases that would benefit the two downstream states by improving low-flow regulation. Flow at Montague gage in New Jersey below the New York line would be controlled never to drop below 1,750 cfs; it reportedly has been down to 800 cfs at times in the past.

New York's petition for a change in the 1931 decree limiting its diversions is now before the court; Pennsylvania and New Jersey have filed their opposition. But now, Supreme Court Master Kurt F. Panzer presumably will be able to present the court with new evidence indicating a meeting of the minds of the three states.

Observers now see simply a pro forma action by the court before its adjournment next spring that would grant the New York petition. This would pave the way for $140 million worth of construction on the Delaware's west branch at Cannonsville. This includes an $81-million, 44-mi tunnel to connect with the city's present Delaware Basin facilities.

Ohio Turnpike

Costs running close to '51 estimates on basis of all but 4 miles let

Construction costs for the 241-mile Ohio Turnpike won't run more than 2½% above estimates made in 1951. This statement by the Ohio Turnpike Commission last week was based on work already placed under contract together with low bids received this month for all but 4 miles of the road.

Contracts for 24 miles of turnpike construction on either side of the Maumee River, and 13 miles at the Indiana state line, on which low bids were received earlier this month, are expected to be awarded before the year's end. This leaves only a 4-mile section through the northern edge of Elyria, open for bids next year.

Total cost for construction of the turnpike, with the exception of the Elyria section, as indicated by contracts awarded and low bids in hand, is $211.9 million. This exceeds the 1951 estimated cost of $207.5 million for the 237 miles of turnpike by $4.4 million—a difference of 2.1%.

Moreover, this $4.4 million over estimated cost will be offset by increased interest earned on invested turnpike funds. Originally, the commission expected to earn $6.7 million on invested funds during the construction period. By the end of this year, however, these invested funds will have earned $9 million in interest. At this rate, according to the commission, the interest earnings should total almost $13 million before construction of the turnpike is completed to a point where it can be opened to traffic on Oct. 1, 1955.

Wide World photo

Electronic sign warns motorists

An electronic device which indicates weather warnings on a display sign has been installed experimentally on the Pennsylvania Turnpike in a new, dramatic move to promote safer driving. A fog warning is indicated by the electric eye principle, rain by a precipitation pickup and snow and ice by a sensing element that correlates temperature with the other two elements. The following combinations can be indicated in letters one-foot high and readable for 200 yd: DANGER FOG—SLOW ROADWAY WET—DANGER SNOW—CLEAR ROADWAY—DANGER ROADWAY FREEZING. Condition signals from the electronic device also can be carried on the turnpike's radio hook-up to increase the area of coverage.

Hell's Canyon issue

Run-of-river plants urged as alternative to large storage reservoirs

The Hell's Canyon high-dam project and several other proposed power schemes with large storage reservoirs in the Columbia River Basin should be trimmed down to run-of-river plants, a state of Washington witness has testified before the Federal Power Commission.

Holland H. Houston, technical advisor to Gov. Arthur B. Langlie, contended that the cyclical storage features of the large reservoir projects are uneconomical as a source of power in adverse water years.

As an alternative, he recommended sizable installation of steam generating capacity to supplement hydro power in years of poor stream flow. Exhibits offered by Houston indicated that steam-generated power for this purpose could be supplied at one-fifth the cost of power supplied from the cyclical storage.

Houston's direct testimony wound up nearly six months of FPC hearings on the Idaho Power Co. application to construct a three-dam development on the Snake River. They will resume Jan. 4 when Houston is to be cross-examined. Other witnesses to be presented by the FPC staff and the National Hell's Canyon Assn. probably will carry the hearings into March.

The state of Washington entered the hearing recently as the intervenor because of its interest in Columbia River development.

While the bulk of Houston's testimony was in opposition to the high dam advocated by NHCA, it also cast some doubt as to the feasibility of the lower storage dams which Idaho Power plans to build in its three-dam scheme.

On the whole, the state of Washington witness indicated general agreement with the Idaho Power plan, noting that the smaller storage dam would cost little more than a straight run-of-river plant.

In urging steam-generated power to replace the power production from cyclical storage, Houston reasoned:

There would be 2,800,000 more acre-feet of storage in the proposed high federal dam at Hell's Canyon than in the low Idaho Power dam. Difference in cost is $252 million. This cyclical storage would furnish 4,850,000 kwh for use once in 20 years. Because of the fixed charges, energy cost would be 5.75 cents per kwh.

Steam-generated electricity would be produced on the same basis at a cost of 1.08 cents per kwh—or about one fifth that from the cyclical storage. This assumes the steam-generating capacity would be used at an average annual load factor of 17.5%, that it could be installed at $150 per kw and the cost of oil would be about $2.20 per barrel.

Reni photo

Holland H. Houston

Stream flow records for the Snake River indicate an adverse water year once every 10 years, and it is on this basis that the Houston exhibits were prepared.

Houston made it clear that he did not oppose all storage projects in the Columbia Basin, but only to the relatively high-cost storage afforded by Hell's Canyon and several others in present Corps of Engineer plans. Besides Hell's Canyon, he pointed specifically to Mountain Sheep and Nez Perce.

Instead, he said storage should be made at smaller upstream sites in the U.S. and Canada.

Houston is carried on the payroll of the Department of Conservation and Development for the state of Washington, but has been assigned since 1949 as an engineering aide to the governor.

Holding a master's degree in electrical engineering from Massachusetts Institute of Technology, Houston has been a member of the American Institute of Electrical Engineers since 1924. His previous connections include Jackson and Moreland, consulting engineers, and the Federal Power Commission as well as regulatory bodies in the state of Washington.

In response to a question at the hearing, Houston said, ". . . I have never worked for a private utility or a public utility in my life."

Power partnership

Firms seek FPC permit to survey $305-million hydro project proposal

Five Pacific Northwest power companies have asked the Federal Power Commission for a permit to investigate the possibility of building a $305-million, two-dam hydro project on the Clearwater River in Idaho.

The venture would involve a "partnership" approach with the federal government in developing the hydroelectric potential of the area (ENR Dec. 17, p. 26).

The proposed power projects would provide 3,730,000 acre-ft of useful storage for power generation, flood control and other beneficial uses.

Bruces Eddy, site of one of the projects, is on the north fork of the Clearwater River about 43 mi east of Lewiston, Idaho. Penny Cliffs, site of the second project, is on the middle fork about 80 mi above Lewiston.

Tentative plans outlined in the preliminary application call for a 576-ft rock fill dam at Bruces Eddy with a power installation of 244,000 kw. The dam would provide, 1,430,000 acre-ft of storage for river control.

The Penny Cliffs Dam would be 296 ft high, with 292,000 kw of generating capacity and 2,300,000 acre-ft of useful storage.

Plans to be worked out by the electric companies will be based on the most recent studies of the Corps of Engineers.

Under the "partnership" approach announced earlier in December, the power companies in the area are cooperating on plans to construct the new power plants. The federal government would be called upon to furnish funds for the non-reimbursable features of the projects, such as flood control, navigation and reclamation.

Alternate bay crossing application to be filed

The California Toll Bridge Authority will file application with the Corps of Engineers for a curved southern crossing of San Francisco Bay from Army Street to Bay Farm Island.

This is the alternative to the proposed straight-line crossing, which the Army Engineers vetoed because it would interfere with Navy plans for expansion of seadrome lanes at nearby Alameda Naval Air Station (ENR Nov. 12, p. 23).

Decision to file the new application followed a ruling by the State Attorney General that the curved crossing would comply with enabling legislation enacted last summer.

Capping artesian wells at Fort Randall points up South Dakota water problem

The job of sealing off artesian wells emptying into the reservoir area of the Army Engineers Fort Randall Dam project is a forerunner of measures that South Dakota must take to preserve its groundwater resources.

The 102 artesian wells in the permanent pool area of the Missouri River project, together with an estimated 5,500 others in the state, are the product of what geologists identify as the state's Lakota and Dakota sandstone formations. Lying one on the other, these formations range from 100 to 200 ft in thickness.

• **How groundwater forms**—The sandstone formation in its South Dakota portion is shaped like a huge underground saucer. It reaches from the Black Hills on the west to the Sioux Falls area on the east, running beneath both Dakotas and coming to the surface at Dakota City, Neb.

Water trickling down the sides of the Black Hills, according to one theory, seeps into the exposed sandstone formation and travels underground to all parts of the state. Because the Black Hills tower above the land in the rest of the state, the water stored in the formation is artesian. Tap the strata with a well in almost any part of South Dakota where the formation is more than 700 ft below ground surface and water will come gushing.

The countless gallons bubbling without interruption for more than a half century reportedly show signs of depleting the underground supply. In central South Dakota, the head has been slackening off about 6 ft per year. Wells have ceased to be artesian in other areas.

• **Why wells are worth capping**—In arid South Dakota, signs of a lessening groundwater supply are a matter of serious public concern. Gov. Sigurd Anderson has appointed a groundwater and artesian well commission to study corrective measures for eventual legislative action.

Because the Fort Randall reservoir would be operating before the state would be ready to do anything about the wells, the Army Engineers were asked to plug the wells in the minimum pool.

Army Engineers are in the final phase of the work. Of the 102 wells, 21 are being plugged. They are the larger wells that contribute the bulk of the 8,000 to 10,000 gpm of well water flowing into the reservoir. It would be uneconomical to plug the others, which have flows less than 5 gpm. Capping of 42 additional wells above the minimum pool area will be delayed, pending possible state action.

Plugging technique had to be worked out as the job progressed, said John Trantina, geologist for the Omaha Army Engineer District.

• **How they are capped**—The largest and most troublesome well in the Randall area was on the White River in Lyman County. This well, drilled between 1900 and 1905, was kicking out between 600 and 1,000 gpm. The water had washed away the surrounding soil to form a bayou adjacent to the White River.

The well was beneath the water's surface and had to be located by probing. Before plugging operations could start, the 30-ft bayou had to be filled as a platform for the workmen. A 3-ft casing was set in the well. Plugging was carried out with mud scientifically selected for the conditions.

Workmen first pumped in bentonite, which swells on contact with water. The object was that this mud would expand and seal off any voids or cracks in the sandstone formation through which the water might be diverted to spout up again.

Next sent down was mud composed of barium sulphate, a very heavy mineral, whose weight would offset the water's pressure. Finally, the casing was plugged with cement. In all, the job required 75 tons of material.

The tremendous force of water generated by some of the wells was demonstrated in no uncertain terms at one location. Workmen had set up their drill rig on a concrete watering trough and sunk a casing in the well. The water had been buoying up the concrete tank. With the water diverted, both tank and drill disappeared into the ground. Only the tip of the rig's derrick was visible when workmen came on the job next morning.

Cost of plugging operations runs from $300 to $8,000 per well.

Bark may take bite out of sulphite waste

Seeking a new approach to its problem of treating spent sulphite liquor, the Falls Paper & Power Co. at Oconto Falls, Wis., is making an experiment with its huge pile of discarded pulpwood bark.

Throughout its many years of pulp making, the firm has accumulated about two acres of useless bark behind its mill. The pile is 20 to 30 ft deep. Industry biologists think the bark pile might prove useful in fermenting the oxygen-consuming wood sugars—the troublesome ingredient in spent sulphite liquor—and thus get rid of them before the liquor reaches the stream.

Using tank trucks normally employed to haul the sulphite liquor away for use as a road binder, mill technical men for some months have been pouring spent liquor on the bark pile. Only recently have appreciable amounts of the fluid begun to appear in the soil beneath the pile. Tests are now being run on soil samples to check penetration and direction of flow and to ascertain what has happened to the spent liquor while making its trip through the pile of bark.

Expectation of industry technical men is that beneficial bacteria deep down in the bark pile and in the soil beneath it may eat the sugar out of the liquor. De-sugared liquor cannot cause any significant stream pollution, say state and industrial scientists.

The experimenters hope treating of dilute liquor and wash water can be accomplished at reasonable cost.

City wants federal loan for 23-mile water tunnel

Denver is going to ask Congress for a $75-million interest-free loan to finance construction of a 23-mi-long tunnel to divert water to the city from Colorado's western slope.

The decision to seek the loan was announced by the Denver Water Board after the Bureau of Reclamation's recommendations to Congress failed to include the Denver tunnel as part of the Colorado River Upper Basin storage project (ENR Dec. 24, p. 22).

The city has approval to divert 177,000 acre-ft annually from the Blue River, a tributary of the Colorado River. City planners say Denver's growth will be halted in 1960 unless more water is obtained.

Glenn G. Saunders, attorney for the board, said all power features will be dropped from the Denver diversion plan to trim the cost from $100 million to $75 million.

Saunders said Denver would repay the loan from water sales revenue. He added that 50 annual installments might be arranged or Denver might float a bond issue, pledging future water revenue, in order to pay off the loan at once.

Holding that additional water would be used largely by expanding federal agencies and the Denver Federal Center, the attorney said he is of the opinion that Denver would be entitled to an interest-free loan.

Expressway commission created for Milwaukee

Wisconsin's Gov. Walter Kohler has signed legislation authorizing a five-member commission to handle construction of a proposed 73-mi expressway system in Milwaukee County. Work already begun by the city of Milwaukee will become the responsibility of the new body.

As each unit of the system is completed, it will be turned over to the county for operation and maintenance. The state, however, will be responsible for those sections that are incorporated into the state trunk highway system.

Under the new law, the city of Milwaukee will transfer to the commission all of its expressway studies and existing contracts. It also will quit claim to the county lands acquired for right of way. The city will be reimbursed over a 10-year period for its costs.

The commission has the power to buy or condemn land in the name of the county. It is required to develop a general expressway plan as soon as possible and to get the approval of towns and municipalities affected; disagreements with local governments will be resolved by the state highway commission. The county board will have final word on construction plans and financing.

Legislation creating the commission had the support of the county, the city and Milwaukee suburbs.

News briefs

• **School building bonds**—The Georgia State School Building Authority is preparing a new $35-million revenue bond issue to finance construction in 52 school systems. This issue will be the third since 1951, when the authority was created to finance school construction through revenue bonds amortized from rentals paid by local school boards for use of the buildings. Earlier issues totaled $95.3 million. A program of some $200 million is planned.

• **Court aids contractors**—Under a new Colorado Supreme Court ruling, any craftsman hauling supplies to be used on a job he has contracted (not supplies intended for resale) will be exempt from carrying commercial carrier certificates. Formerly, contractors had to obtain permits from the state Public Utilities Commission—the same as regular commercial truckers who transport supplies throughout the state for resale.

• **Primary road problem**—New data gathered by the North Carolina Highway Department show there are 2,815 mi of primary roads in the state that must be modernized (estimated cost: $305.9 million). In a recent report to the North Carolina Highway Users Conference in Raleigh, Highway Chairman A. H. Graham said: 'The state has paved more than 13,000 mi in the last four years, but meanwhile the primary system has grown out-of-date; a total of $99.6 million was collected by the state road fund during the last fiscal year, and out of this $6.1 million went for non-highway purposes.

• **Alcan tunnel completed**—Hard rock miners, blasting 2 tons of rock in 21 months, have finished boring the 10-mi power tunnel between the Kemano power plant site and Lake Tahtsa in Aluminum Co. of Canada's giant aluminum project in northern British Columbia. When completed, Alcan's underground powerhouse (the world's largest) will operate new aluminum plants now being built at Kitimat (ENR Sept. 15, p. 32).

• **Schooling in testing** — Thirty-five Wyoming Highway Department engineers and assistants are taking a course in fundamental materials testing and design procedures at the department's laboratory. The schooling, which teaches methods for checking materials used on various field projects, is divided into two sections: a 10-day course for those who have not attended previous lectures, and a 5-day refresher course.

• **Columbus traffic cure**—Construction of the Spring-Sandusky Street interchange will be launched this January in Columbus, O., the initial link in a proposed $39-million innerbelt system to relieve traffic congestion in the downtown district. A local firm, Visintine & Co., was low bidder ($2.1 million). Construction involves three new highways (total distance: 1.2 mi) plus cloverleafs and an underpass at the Spring-Sandusky intersection. Completion is set for fall, 1955.

• **Expanding power company**—To meet population and business growth, British Columbia Electric Co. will undertake a $33.2-million expansion and improvement program in 1954. These are the main points: (1) Completion of the fourth generating unit at Bridge River ($2.3 million); construction on the La Joie storage dam ($3.2 million) and on the first unit of the Seton Lake hydro development below Bridge River ($1.7 million); (2) construction, enlargement and improvement of electrical generating and distribution facilities on the lower mainland and in Vancouver ($15 million); (3) building a 70-mi, 345,000-v transmission line from Rosedale in the Fraser Valley to Pemberton Meadows.

Snow removal by sprinkler truck

Snow and ice removal from the streets of Glenwood Springs, Colo., can be accomplished with the city sprinkler truck, which carries 165 F water from the resort's hot springs pool. The truck is equipped with a pump that sprays the water under pressure. Outside temperature must be above freezing before the method can be employed however it's a rare day in the high mountain resort community that the maximum temperature is below freezing point.

Building trades harmony in the balance

Alan Adams
Washington Bureau

American Federation of Labor hopes of settling bitter jurisdictional battles among its powerful affiliates are bound up part-and-parcel with the no-raiding pact the federation recently reached with the Congress of Industrial Organizations. If AFL unions go along with the CIO agreement, the chances are they'll come to terms on an intra-federation peace pact.

While the AFL-CIO contract is now on the books and awaiting the signatures of leaders of the 110 AFL and 35 CIO unions, the AFL is working on its own plan for halting costly membership and job wars. The AFL Building Trades Department is right in the middle of the project.

The move to bring jurisdictional fights to an end was started last September when building trades president Richard Gray came up with a proposed plan at the AFL convention. He insisted that it was time for the AFL to settle its own internal problems, rather than concentrating on making peace with the CIO. AFL leaders weren't too fond of Gray's program. It called for a complete rewriting of the jurisdictional lines of the various unions—a project they considered to be of incalculable complexity.

• **In the works**—But Gray started the ball rolling. A five-man committee of AFL leaders was authorized to come up with an acceptable agreement. This is now in the works. The deadline for the plan is February 1—date of the AFL's powerful executive council winter meeting in Miami. This will be the big issue facing the Building Trades Department for its leaders huddle in their own session late next month just before the council meets.

Building trades spokesmen report that "four or five" propositions are now being considered, including a model patterned after the CIO's own organizational disputes plan. This provides for a director to make final and binding decision on which of CIO unions in a dispute should be granted the right to organize non-union plants. His ruling is enforceable in the courts. (A typical issue: Should the chemical union or the electrical workers be allowed to organize a plant manufacturing batteries.)

Almost from the time the AFL was founded 73 years ago, the federation has been plagued by disputes over which of its unions should have the right to perform certain types of work. Construction unions have been beset with more troubles on this score than any others. When a new type of material was introduced, a new method of construction developed, the unions fought to do the job. In recent years this has grown to such proportions that Gray warned that unless the battles were halted they would "wreck the labor movement."

The AFL-CIO no-raid pact was an outgrowth of this sentiment. But while union leaders want an end to union struggles, it is not at all certain they can develop an effective truce. The inter-union agreement is a good example of the problems they face.

• **Beck the key**—When AFL president George Meany and the CIO's Walter Reuther signed the agreement, they committed both federations to the no-raiding principle. However, their unions will not be bound by its terms unless, and until, they sign up. Most of the unions are waiting to see what one man does—Dave Beck of the fast-growing teamsters union. Beck makes no bones about his belief that the teamsters are entitled to members now belonging to other unions—both in the AFL and CIO. The teamsters believe that present jurisdiction would be frozen and they would lose all opportunity to corral these workers if Beck signs the pact. In any case, he won't decide until the teamsters' executive board meets in March.

Meanwhile, what happens to the agreement? It will not go into effect as scheduled on January 1. In fact, it won't become operative until the big unions go along and this should be several months, at the least.

Beck is being watched by building trades and AFL unions for his decision on this pact. They believe this will be the tipoff on whether Beck will agree to an intra-AFL agreement. If one works, the other should too.

For instance, Beck charges that the carpenters are hauling logs by trucks over main western highways—work that should be performed by his truckers. He claims that other construction unions are trucking equipment stockpiled at large job sites to the project itself, another job task within the teamsters jurisdiction. Will he insist on trying to organize these workers before joining an overall agreement?

Behind-the-scenes of the jurisdictional program, some AFL unions are seeking to work out their problems separately. The machinists' Al Haves is a leader in this movement. He is currently meeting with the carpenters in an attempt to settle a dispute that has raged for 40 years on whether the machinists or millwrights should be granted firm jurisdiction to install certain types of machinery.

Last week Haves chalked up one agreement. The machinists and printing pressmen came to terms setting out pressroom jurisdiction, appointing an arbitrator to decide any disputes that continue to rise. This illustrated what the entire AFL hopes to do.

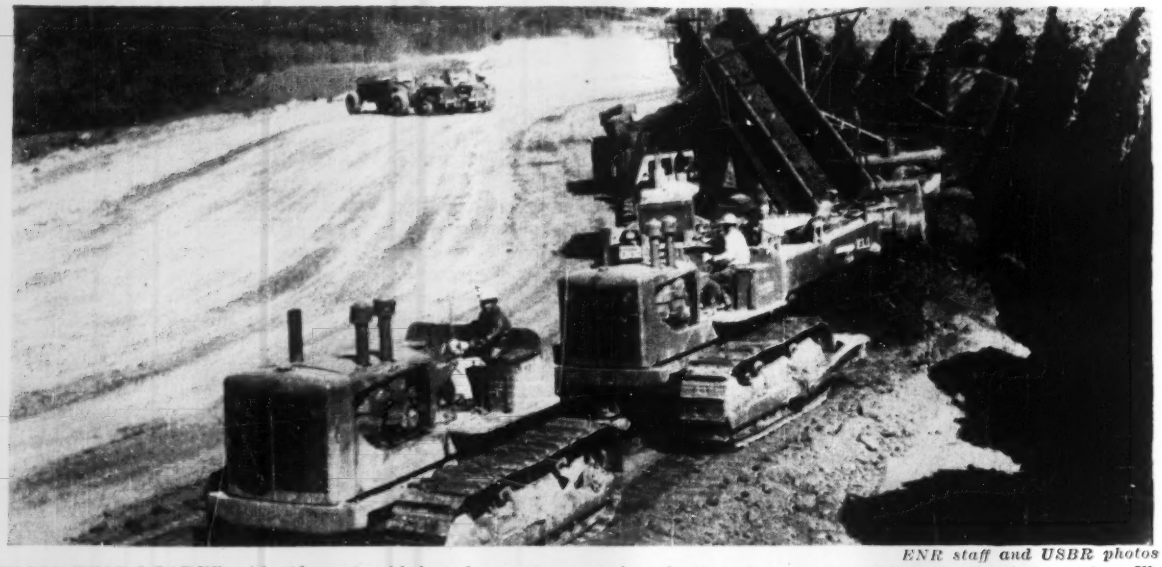
But even if the five-man AFL committee comes up with a favorable plan, it is not expected to become operative until after the AFL convention next fall—at the earliest. Building trades officials say it will take study and negotiation before battles running for scores of years can be wiped out by an effective truce plan.

Labor briefs . . .

• **Strike settlement**—Some 800 members of the painters union in Maricopa County in central Arizona have ended a 24-day strike. They won an 8½-cent hourly raise, bringing the hourly rate up to $2.58. But they failed to get the health and welfare plan they had demanded.

• **United front**—Unions in Cleveland are cooperating in a campaign to ferret out non-union labor on construction jobs in the city's outlying areas. According to Thomas McDonald, president of the Cleveland Federation of Labor and business representative of the Cleveland Building Trades Council, roving squads of union men will be sent out to check on suburban jobs.

• **Jurisdictional dispute**—Some 450 men have gone back to work at the $4-million Standard Oil phenol plant under construction at Richmond, Calif., after the contractors (Stone & Webster Engineering Corp.) got a temporary court injunction restraining picketing. The month-old work stoppage was a result of a jurisdictional dispute. AFL teamsters accused AFL steam fitters of loading and unloading pipe and material from teamster-operated trucks.



ENR staff and USBR photos

ELEVATING LOADER with side-cutting blade is key to economical production of greater part of Palisades Dam's impervious fill.

Palisades Dam—an earthfill with special features

More than 2,000,000 cu yd of fill placed in short season despite delays and "temperamental" borrow pits

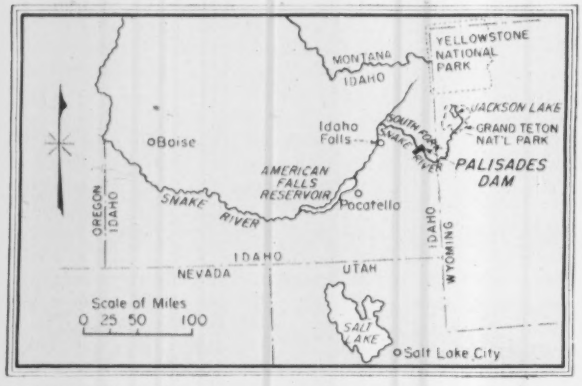
Work on Palisades Dam in Idaho—the Bureau of Reclamation's largest earthfill structure—got into full swing during the 1953 construction season with more than 2,000,000 cu yd of fill placed. Operations were hampered by a short season (embankment placing was shut down Oct. 22) and by delays in completion of power and outlet tunnels that are to serve as diversion conduits. Borrow areas for the vital impervious fill were major problems—one was wet and the other dry, but both had to be fully exploited.

Design features of the project center around foundations. The left abutment is founded on a hard andesite which also supports the powerhouse and is penetrated by three tunnels—for spillway, outlet and power supply. The central part of the dam rests on relatively tight formations of sedimentary origin. But the surface of the andesite is erratically eroded, and the formation is steep and jointed. This has led to use of two cutoff trenches and an upstream blanket of impervious fill over the sedimentary formation as well as of double concrete cutoff walls between the andesite and the fill.

• **Purpose**—Primary purpose of the Palisades project, located on the South Fork of the Snake River, is to provide irrigation storage. Two droughts in the early 1930s caused crop losses of more than $10 million in this southeastern Idaho area. The reservoir will be operated in conjunction with the existing American Falls Reservoir and Jackson Lake to firm up storage for 650,000 acres (famed for Idaho potatoes). And some 43,650 acres of new land can be irrigated.

Palisades Reservoir will permit Jackson Lake in the spectacular Grand Teton National Park to be held full in all except the driest years. This will greatly enhance use of the lake for recreational facilities. In fact a multi-million dollar hotel-resort project is under way on the shores of the lake already.

Power to be generated in a 114,000-kw power plant will be used to serve the needs of the Pocatello-Idaho Falls area. Expansion of the phosphate industry and construction of Atomic Energy Commission facilities to-



PALISADES DAM is in eastern Idaho, where it will conserve irrigation water for the Idaho Falls-Pocatello agricultural area.

PALISADES DAM FACTS

Volume	13,800,000 cu yd
Height	Above streambed—258 ft; above lowest excavation—301 ft
Crest length	2,200 ft
Crest width	40 ft
Base width	2,250 ft
Reservoir	1,400,000 acre-ft (20 miles long, 3 miles wide)
Outlet tunnel	1,546 ft long, 26 ft ID net
Power tunnel	1,212 ft long, 26 ft ID net
Spillway tunnel	1,900 ft long, 28 ft ID net
Power house	114,000 kw installed capacity
Cost	$76.6 million ($53.4 million reimbursable)

TWO CUTOFF WALLS are located in left abutment where andesite rock forms foundation. Diversion channel, kept open because of late completion of diversion tunnel, limited area that could be filled in 1953.

gether with natural growth of the area have taxed existing facilities. First power is due in 1956.

Finally, the dam will help prevent floods in the same upper Snake River area. Average annual flood control benefits have been estimated at $900,000.

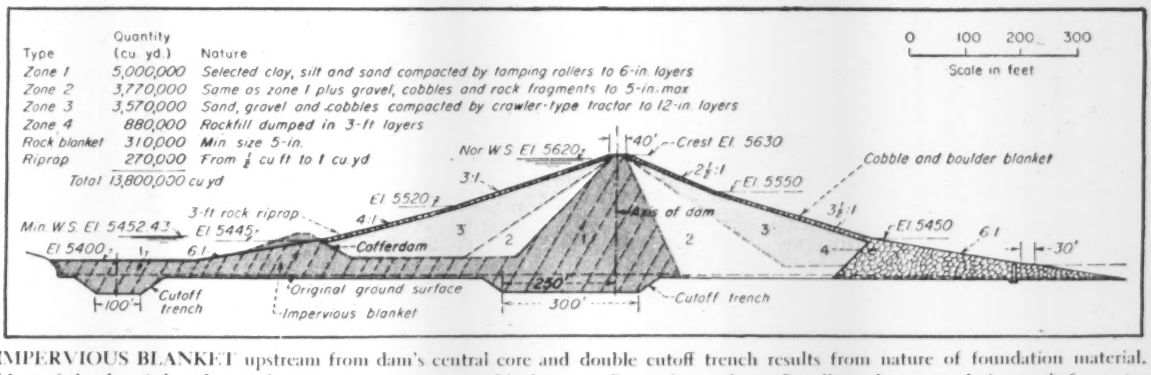
The project will cost $76.6 million with $53.4 million being reimbursable.

• Double cutoff trench—The tilted sedimentary strata (mainly highly-compacted clayey silt-stones, but including a gravelly layer near the dam's base) under the dam and on the right abutment, are considered more than adequate to support the weight of the dam. But to make sure that no direct paths of percolation are formed, design calls for two cutoff trenches. One is in the usual place directly under the central impervious core (this is 300 ft wide). The other (only 100 ft wide) is at the extreme upstream toe. It connects with the impervious fill that forms a horizontal blanket under the upstream part of the dam.

Where the dam is founded on andesite, a two cutoff wall detail is used to impede percolation along the interface between the andesite and the fill.

Concrete work at Palisades Dam is held to a minimum, only the tunnel linings, outlet structure, powerhouse foundations and intake being of this material. The powerhouse is to be of reinforced brick construction—the first brick powerhouse ever built by the Bureau of Reclamation.

• Tunnels delayed—Complicating the 1953 fill program was the fact that the power and outlet tunnels to be used for diversion during construction had not been completed. These were excavated under an earlier contract for $1,242,700 held by J. A. Terteling & Sons. Original completion date was Aug. 3, 1952. This was extended because of delays in receiving steel


Type
Quantity (cu. yd.)
Nature
Zone 1 5,000,000 Selected clay, silt and sand compacted by tamping rollers to 6-in. layers
Zone 2 3,770,000 Same as zone 1 plus gravel, cobbles and rock fragments to 5-in. max
Zone 3 3,570,000 Sand, gravel and cobbles compacted by crawler-type tractor to 12-in. layers
Zone 4 880,000 Rockfill dumped in 3-ft layers
Rock blanket 310,000 Min. size 5-in.
Riprap 270,000 From ¼ cu ft to 1 cu yd
Total 13,800,000 cu yd
0 100 200 300
Scale in feet
Nor W.S. El. 5620
40'
Crest El. 5630
Cobble and boulder blanket
El. 5550
El. 5520
3-ft rock riprap
Min W.S. El. 5452.4
El. 5445
Axis of dam
El. 5450
El. 5400
Cofferdam
30'
Original ground surface
Impervious blanket
250'
300'
100'
Cutoff trench
Cutoff trench

IMPERVIOUS BLANKET upstream from dam's central core and double cutoff trench results from nature of foundation material. Most of the dam is based on sedimentary strata; upstream blanket, cutoff trenches and cutoff walls prolong percolation path for water reaching foundation material.

DRAGLINE CRANE AND SHOVEL load impervious material. Units are same make and model except one is rigged with a crane boom and the other with a dipper stick. Water is added at borrow pit as necessary.

for tunnel arch supports on account of the materials control plan and also because of strikes. Actual completion was March 16, 1953.

But before the river can be diverted through these tunnels, the prime contractor—Palisades Contractors, Inc., who hold a $29-million contract—must do extensive work at the inlet and outlet ends and line the tunnels. This work, too, has been delayed—particularly the tunnel lining work because of difficulties with the concrete pumping arrangement. But this trouble as well as the various other tunneling bugs have been worked out. It appears now that diversion through the tunnels will take place in July or August, 1954. Meanwhile, Palisades Contractors is working through the winter on tunnel lining and expects to have it completed next spring.

Right now the river is diverted through an open channel dug along the right abutment. This has permitted excavation to satisfactory foundations across some 80% of the dam. But the amount of filling that could be accomplished in this incomplete area was limited by specifications requiring that fill placed above El 5445 be in lifts extending from abutment to abutment. Below that elevation a 1 on 4 slope was to be maintained along the bonding surfaces between previously-completed portions of the dam embankment and material to be placed later. Thus, for every foot of fill depth up to El 5445 there was to be 4 ft less of filling width available.

• **Limit raised**—Purpose of these requirements was to prevent the occurrence of channels where percolation rates are greater than permissible. And, because the impervious fill width narrows down as the dam embankment gets higher, percolation paths become correspondingly shorter. However, on account of the delay in tunnel completion and the necessity for placing substantial quantities of fill in 1953, the partial-fill height limitation was raised to El 5500. This is still within safe limits—with a lower safety factor.

Fill height in 1953 reached El 5460. That still leaves 40 ft of fill that can be placed on the left abutment in 1954 before the height limit is reached and before the river is diverted through the tunnels.

• **Impervious fill emphasized**—The 1953 construction season emphasized placing of impervious fill in the dam. And there is a good reason for this. Some 9,000,000 cu yd of impervious fill (zones 1 and 2) must be placed during three construction seasons (1953, 1954 and 1955). Placing is limited by the 2200-ft width of the canyon and can be accomplished only during frost-and-rain-free periods. So this work must be pushed at every opportunity.

During 1953 1,025,000 cu yd of zone 1 and 400,000 cu yd of zone 2 material went into the dam. This compares with 650,000 cu yd of all other material placed in 1953 and 1,033,000 cu yd placed in 1952.

Thus, the contractor's main problem has been to develop production of the two impervious zones. (The only difference between zone 1 and zone 2 material is that the latter can include gravel, rock fragments and cobbles up to 5-in. size. Zone 1 must be entirely clay, silt and sand.) And as the blanket of zone 1 material plus the central core of the same fill total 60% of the structure's base width, of necessity emphasis has been on the zone 1 fill.

Two borrow pits supply zone 1 fill. And, although good quality fill comes from each, they are entirely different in character. Thus, excavation procedures are different.

One pit is relatively level and contains an estimated 3,500,000 cu yd of suitable material. The other pit has 2,000,000 cu yd on a relatively steep hillside. But the level pit is damp whereas the hillside pit is dry. And as 5,000,000 cu yd of zone 1 fill is needed, both pits must be worked.

Both pits are located more than a mile from the fill areas. Thus, high speed, large-capacity, rubber-tired hauling units were indicated.

In the relatively level upstream pit two 140-hp tractors haul a fast-moving elevating loader equipped with a 12-ft high side-cutting blade. The damp character of this deposit makes the soil cohesive enough to be ideal for side-cutting operations.

The dampness, however, adds complicating factors. The pit cannot be worked until late enough in the season for atmospheric conditions to provide some natural drying. And even then, only one 9-hr shift during the most favorable daytime hours is possible. Further, the contractor has had to devise means for reducing the moisture content. A series of trenches dug by backhoe and dragline proved to be

only a minor aid. Best means of reducing moisture has been to provide enough vertical embankment so that the side-cutting elevating-loader takes at least 45 min between passes. Natural drying during that time reduced the moisture content 2 or 3%.

Material excavated by dragline in providing corridors for the elevating loader to work is loaded in trucks for hauling to the fill if it is dry enough. If not, it is side-cast to be picked up by the loader later.

Production by the loader has been as high as 6,000 cu yd for a 9-hr shift. Average is 4 to 5,000 cu yd.

The downstream borrow pit is an entirely different-type of operation. Although well suited for impervious core fill, it is more silty. That, along with its side-hill location, makes it a much drier area. Thus it can be opened early in the construction season and worked on a 2-shift basis.

The contractor has found that a combination of a 5½-cu yd shovel and a 7-cu yd dragline are ideal for working this pit. The dragline works uphill where the slopes are flatter and a longer reach is necessary. The shovel works downhill where it can bite into the bank with relative ease.

For two 9-hr shifts, a good day's production is 5,000 to 6,000 cu yd from the dragline and 7,000 to 8,000 cu yd from the shovel.

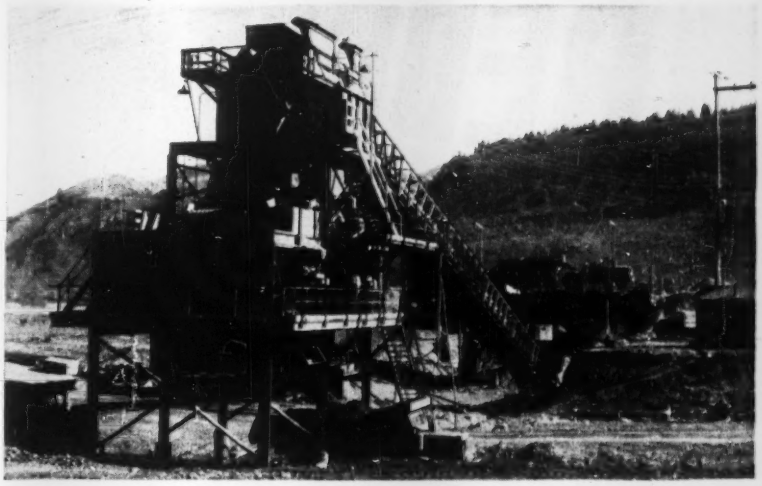
Complicating the downstream borrow area is the fact that it is across the river and across a state highway from the area being filled in 1953. High water during the 1953 flood season threatened to undercut foundations of a girder bridge serving the construction work. Contractor personnel forces have waged a running battle to keep the bridge in service and prevent isolation of the entire left-abutment work.

As for the highway, the Idaho Highway Department required the contractor to construct an overpass separating fast-moving, heavily loaded construction equipment from regular traffic. This has proved to be of great advantage to the contractor.

• Zone 2 important too—Almost as important as zone 1 in these early stages is zone 2 fill. It is placed and compacted by 12 passes of a 4,000-lb per ft sheepsfoot roller in the same manner as zone 1.

A stationary grizzly screened oversize rock from zone 2 fill as a temporary expedient during the 1952 construction season and early in 1953. In mid-1953, a separation plant was placed in operation that has developed the production for full-scale operation.

The plant includes an unloading hopper that can be serviced by bottom-dump trucks. A plate feeder moves the material onto a conveyor belt that lifts it to the separation plant. Two vibratory 5-in. screens remove oversize rock. Bins and unloading chutes for the two classes of material complete the unit.



SEPARATION PLANT removes oversize rock from zone 2 fill. Plant includes unloading hopper, belt feeder, conveyor belt, two 5-in. vibratory screens, truck loading chutes.

Over-size rock is used in the rock toe of the dam or for a rock-and-cobble downstream blanket on the face of the dam.

• Highway relocations extensive—The Palisades work necessitates relocation of the state highway along the right bank of the reservoir and of a Forest Service road along the left bank.

Two fills in the highway realignment are, in themselves, small dams. One includes 1,500,000 cu yd of fill and the other some 600,000 cu yd. These fills are built up of zone 1 and zone 2 material much like the main dam fill is. Large-size culverts equalize water level on each side of the fills. But to assure stability under saturated conditions, the fills must be made of well-compacted material.

To date, three separate contracts have had to do with the state highway relocation. One of these is the prime contract for dam construction, which includes 2½ mi of road work. A separate contract for an additional 2½ mi was administered by the Idaho Highway Department and has been completed for 2 years.

A 5½ mi section is now under way under a $500,000 contract held by S. Birch & Sons Const. Co. of Great Falls, Mont. Some 10 mi of work is yet to be awarded.

Also of interest is a bridge across the Snake River at the upper end of the reservoir. The structure is a three-span continuous plate girder bridge (mid-span 264 ft; side spans 136 ft).

Two contracts have been awarded for the bridge work. The substructure contract for $176,580 is held by J. A. Jones Construction Co. and Charles H. Tompkins Co. (the same contractors holding the prime contract on the dam). The superstructure contract for $296,270 is held by LeBoeuf-Dougherty Contracting Co. and Erickson & Pierson of Richmond, Calif.

PALISADES DAM MANAGEMENT

Prime Contractor	Palisades Contractors, Inc., a joint venture of J. A. Jones Construction Co., Charlotte, N. C., and Charles H. Tompkins Co., Washington, D. C.
Contractor personnel	Project manager—A. L. Pauls Asst. Proj. Manager—Paul H. Swanson General super.—W. H. Kennish
USBR personnel at Denver	Chief engineer—L. N. McClellan Chief designing engineer—K. B. Keener Earthfill dam design engineer—Fred Walker
at Palisades	Construction engineer—Louis B. Ackerman Office engineer—Gus Swanson Field engineer—Pat O'Donnell

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ABOVE—Reinforced concrete roof slab construction.
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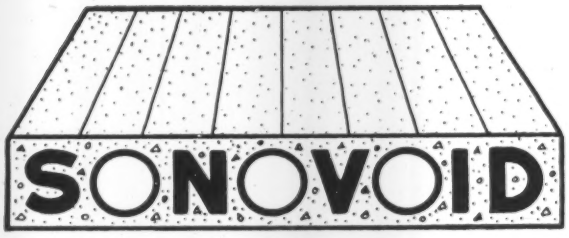

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WINDOWLESS BUILDING at Walter Reed Army Medical Center.

Objective: Bomb resistance

The Armed Forces Institute of Pathology, to which finishing touches are now being put at Walter Reed Army Medical Center, Washington, D. C., is a massive structure of reinforced concrete extending five stories above ground and three below. It looks the role it is intended to play—protection of occupants against blast and radiation from an atomic bomb.

Except for two small office wings at the ends of the 206-ft long building and the first-floor recreation area, the exterior walls are windowless. The thick reinforced concrete walls rise from the foundations to the roof with openings only for access, utilities and ventilation ducts. And these gaps are protected by "blast" doors.

But the exterior is by no means the only unusual feature of this building:

• Designed to provide facilities for research on diseases, it will house all the activities ordinarily found individually in office buildings, research laboratories, hospitals, printing establishments, educational centers, photographic studios, theaters, television studios, metal and woodworking shops, and warehouses.

• Secondly, with no windows to admit light and air, a man-made environment had to be created to permit these activities to be carried on efficiently.

• And thirdly, to offset the added structural cost necessitated by the blast-resistant design, it was vital that the most economical plan possible be developed for the arrangement of facilities. Furthermore, the layout had to be flexible so that alterations could be made easily to accommodate future changes in the institute's programs.

• **Economical floor plan**—The designers selected a double-corridor plan. The usual arguments against such a layout—poor lighting and ventilation in the interior and increased width of building compared with a single-corridor plan—do not apply in this case. Artificial lighting and air conditioning must be provided throughout the building anyway, and though a wider structure is required, the greater will be its resistance to blast.

On the other hand, the double-corridor scheme offers several advantages: Laboratories are placed back to back, with a continuous mechanical service core between them, along the longitudinal center line of the building. This layout not only is economical of space and services but satisfies the requirements of flexibility as well.

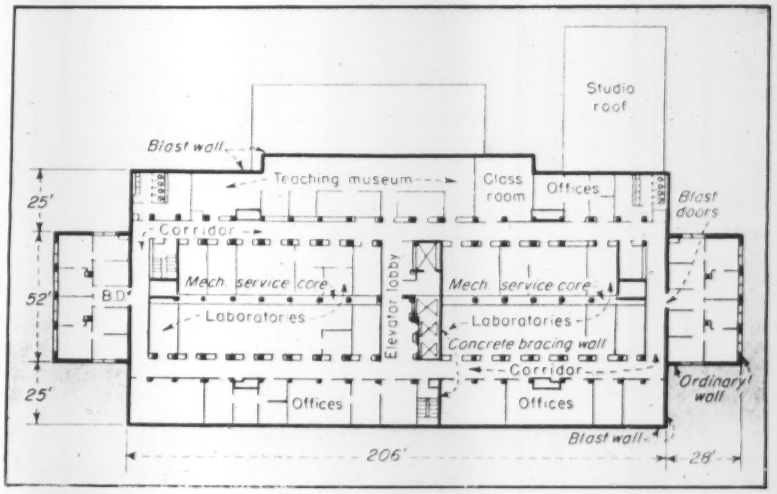
Vertical transportation is provided by five elevators—two passenger type, one hospital service type and one freight elevator, located in the center of the building along a lobby connecting with the two corridors, and a mortuary elevator near the ambulance entrance.

To shield the structure against blast and radiation, as much of the building as practicable was placed below grade. Sub-basement and basement are entirely underground, and so is at least half of the ground floor. In this way, excellent protection will be afforded a large number of assembly places for personnel, as well as for storage areas for the institute's irreplaceable records and specimens.

• **Flexibility of space use**—Story height above the first floor is about 12 ft, but below, distances from floor to floor vary from 17 to about 20 ft. Hence, it is feasible, when more space is needed in the future, to subdivide the lower stories. Overhead pipes and ducts were run between beams so as not to decrease the headroom of future tiers.

Flexibility is obtained on the upper floors through modular design for the laboratories and offices, and employment of movable partitions. A partition placed at any modular boundary and on either side of the service core can be supplied with any services needed from the core. Pipes can be added or removed without disturbing anyone outside the laboratory being altered. In addition, each laboratory module is equipped with its own corridor door plus lights and ventilation.

Similarly, areas along the outer walls on these upper floors may be sub-



DOUBLE-CORRIDOR PLAN of typical floor above grade allows space to be subdivided as needed with movable partitions. Laboratories line up along mechanical service cores along the building center line.

divided with movable partitions. Corridor partitions, however, are fixed and more fire-resistant.

Provision also was incorporated in the design for future expansion of the building at either end. Knockout panels have been installed at the points where future corridors will connect with existing facilities.

Four principal entrances—one on each side of the building—provide access to the interior. In addition, a tunnel connects with the Walter Reed Hospital.

• **Bomb-resistant design**—To resist a bomb blast, the structural frame and the reinforced concrete blast walls enclosing the building were designed to withstand large lateral forces—a positive pressure of 27.2 psi and negative pressure of 13.6 psi on the south wall, which faces the center of the city, together with a positive pressure of 13.6 psi and negative pressure of 6.8 psi on all other sides and the roof.

Exterior walls above grade were made 12 in. thick, and the foundation walls 16 in. Also reinforced concrete walls were included in the interior of the building to help resist the pressure. All walls are braced by the floor systems, which are of reinforced concrete beam-and-slab construction.

With one exception, openings in blast walls will be closed off automatically by doors designed to withstand the same pressure as the walls. A guillotine-type blast door is used for duct openings, and a side-hinged type, for all others.

The exception is the incinerator flue, which the designers did not consider it practicable to close off with a blast door. Instead, the chimney and incinerator room are enclosed in reinforced concrete to withstand a blast. Though the incinerator itself might be destroyed, the effects of a blast would be confined to the room.

• **Architectural treatment**—The walls were cast in place. For architectural purposes, the vast exterior surfaces of the building were panelized and given a textured finish.

Panels are outlined by horizontal and vertical 1½-in. V-joints. The textured effect was created by lining the plywood forms for the outer surfaces with slash grain Douglas fir boards, which varied in both thickness and width and were dressed on the edges only. The boards were set horizontally or vertically in each panel, the direction being different in adjoining panels.

Concrete for walls and floors was truck-mixed. At the site, it was delivered to a 2-cu yd hopper and distributed to the forms with hand buggies.

Attaining a strength of 3,750 psi in 28 days, the 1:1.8:3.2 mix contained 6½ bags of cement per cu yd, 290 gal of water and ¾ oz of an air-entraining admixture, which was added at the mixer. Maximum size of aggregate was ¾ in. Footing concrete was a 5½-bag mix with a strength of 3,000 psi.

• **Sewage disposal**—Water supply and sewage disposal for the building take advantage of existing city systems. Sewage from the upper levels of the building will flow by gravity to city sewers, while that from low levels will be ejected by a pneumatic system. Acid drainage from the laboratories will be discharged through high-silicon-content cast iron pipe. It either will be discharged independently to the street sewers from upper levels or through diluting chambers before being pumped from the low-level system.

Drainage from a radioactive isotope area on the fourth floor will be conducted through an independent system to city sewers. In the future, decontamination chambers may be incorporated in this system, if needed.

• **Man-made environment**—Air conditioning the building was a difficult problem. Because of wide variations in construction, occupancy and equipment, ideal conditions could not be obtained without an extravagant expenditure of funds. Compromises were necessary.

Only in the laboratories could conditions be controlled within comfort limits. Even there, though, the designers expect that the effective temperature (a function of inside dry-bulb temperature and inside relative humidity) may range from 70F minimum to 78F maximum during the summer, depending on the variable heat loads generated by occupants and equipment. As a result, the proportion of comfortable occupants may vary down to 5%. During the winter season, the effective temperature may range from 65F to 73F, and the proportion of comfortable occupants may vary down to 35%.

To alleviate extreme summer conditions that might prevail temporarily in a few laboratory modules, there was incorporated in each service core a set of "selective-cooling" chilled-water risers with valved and plugged extension tees at each laboratory floor. Individual unit coolers may be connected to these temporarily, as needed.

Steam for air conditioning, heating coils, hot water and laboratories will be conducted from a central heating plant at a pressure of 100 psi. The main will run about 2,800 ft through existing tunnels to the new building, where the pressure will be reduced for use in the various services. Steam condensate will be pumped back to an existing hot well in the boiler house.

General lighting will be fluorescent, providing at least 55 ft-c at working levels.

• **Electric power**—The electrical system of the building was designed to provide continuous service. Purchased power will be brought in at 13.2 kv with two important feeders. In addition, a 120-v battery set and a 165-kw diesel generator will furnish emergency service for lighting corridors and stairs and for powering a few exhaust fans.

General building 208/120-v service will be distributed by bus duct split into two zones. Tapoffs will be made from the bus duct at various intervals to feed the laboratory and office areas. There, a system of underfloor ducts will be provided not only for power distribution but also for telephone and intercommunication wiring.

Each laboratory module will have an individual multi-circuit breaker panel. From there, power will be distributed through a series of wire raceways over the laboratory benches, thus enabling technicians to plug in at any point. For equipment not in the 120/208-v range, two "casual power" risers, with tapoffs on each floor, will be provided in the service cores. Power can be supplied from switchgear in the sub-basement or by portable generators.

• **Designers and builders**—The Armed Forces Institute of Pathology building was designed by Faulkner, Kingsbury & Stenhouse, architect-engineers, Washington, D. C. Marshall & Gongwer was the consultant on structural engineering, and Guy B. Panero, Engineers, Inc., on mechanical and electrical engineering.

Cramer-Vollmerhausen Co., Inc., is the general contractor, with Robert Argenbright as superintendent of construction and R. M. Head, project manager. The $5-million contract averages $18 per sq ft of floor area and $1.95 per cu ft, exclusive of elevators.

Design and construction of this Army Medical Corps project are under the supervision of the Army Corps of Engineers, with Col. Ray Adams, Washington District Engineer, in immediate charge and Col. B. B. Talley for executive direction. F. S. Vasquez is project engineer; and Charles H. Elder, assistant project engineer. The structure is expected to be completed in April.

DOW

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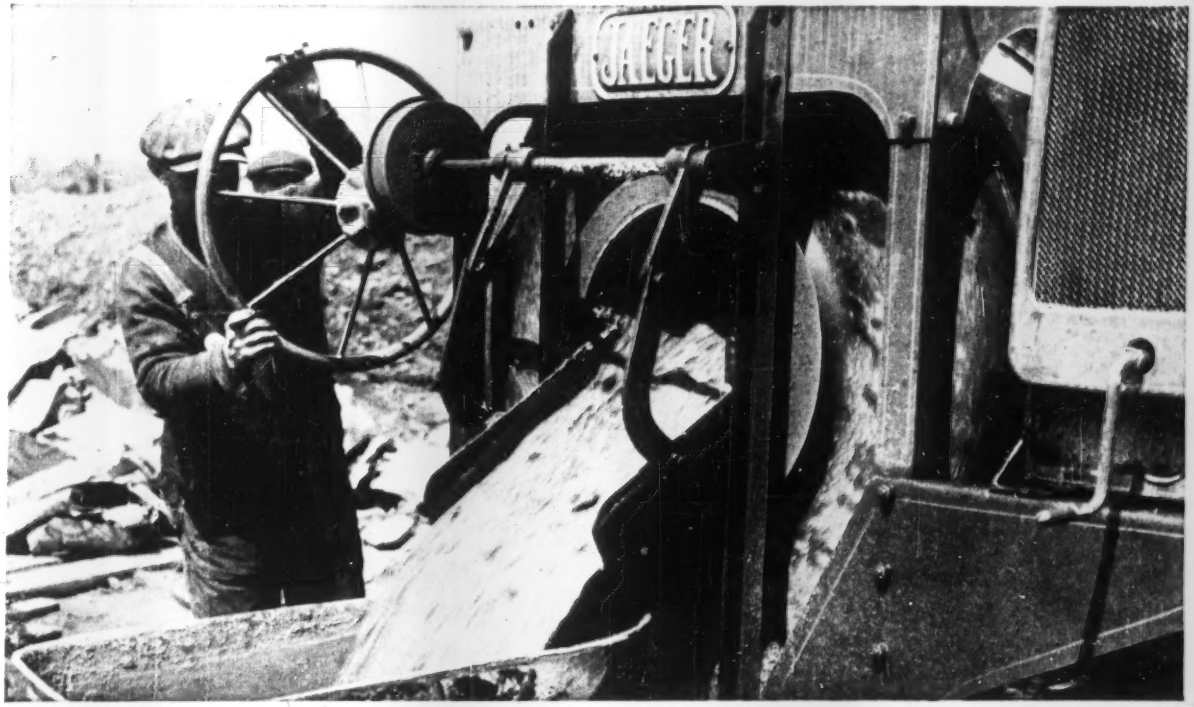


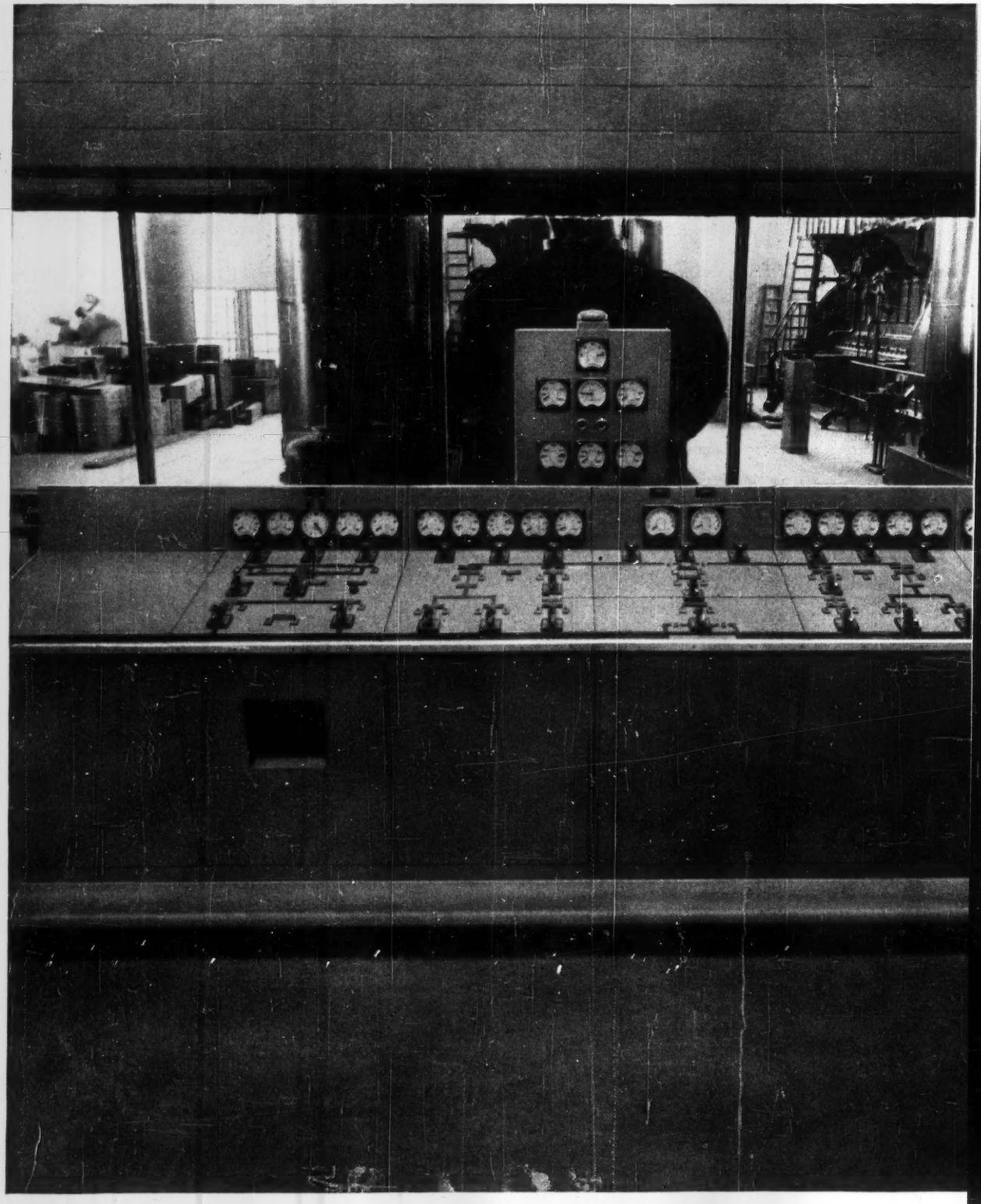
Modern construction methods do not permit long wasteful periods of waiting for concrete to gain working strength. Consequently, the use of Dowflake®, Dow calcium chloride 77-80%, as an admixture is extremely important.

At a temperature of 25°F., plain concrete requires six weeks to attain a strength of 2000 p.s.i. With a 2% addition of Dowflake, at the same temperature, and using the same protective measures, only seven and one half days are necessary, a *saving in time* of over 80%. Naturally at low temperatures, with or without Dowflake, it is necessary to use heated aggregate, warm water, tarpaulins,etc. Dowflake provides curing, too, by reducing the moisture loss during the early hydration period and by accelerating the hydration action while moisture is present.

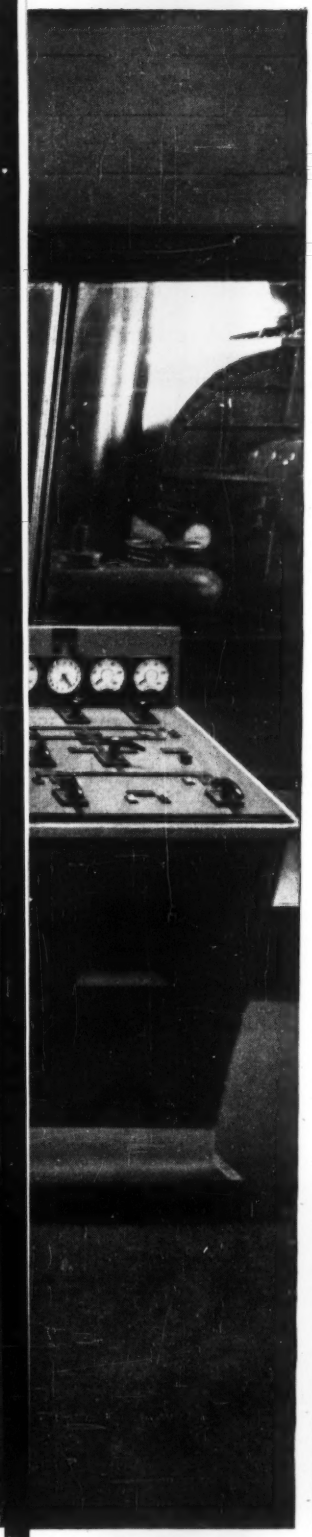
Dowflake may be used with *all* brands of Portland cement. If you are not already taking advantage of the benefits of Dowflake, write Dow today for complete information on how Dowflake makes sure that you meet tight production schedules *all year around*. THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on DOW CHEMICALS

DOW



New Hunts Point Sewage Control Plant, Bronx, New York, has a design capacity of 120 million gallons per day (mgd). Future plant expansion will ultimately increase capacity to 150 mgd. J. Livingston & Co., New York City, electrical contractor.



Sound planning and unit equipment assure reliable power at Hunts Point

Service continuity is extremely important to the new 120-mgd Hunts Point Sewage Disposal Works—significant step in the City of New York's pollution control program. Shutdowns would affect a tributary population of 770,000 in a 15,613 acre area.

Based on a careful study during the blueprint stages, engineers for the Department of Public Works, City of New York, designed a duplex electrical distribution system. It assures reliable service by providing dual feeders, switching capacity and transformers, plus electrical tie breakers.

Supplementary power is available from two by-product gas engine generators—each rated 875 kva. These can also be operated as blower drive motors.

Westinghouse power, switching and control equipment play a vital part in the duplex system. Co-ordinated specifically for Hunts Point, this completely unitized line installed easily. It simplifies maintenance due to accessibility of breakers and controls. It assures easy, economical expansion because of its inherent flexibility.

Hunts Point is another instance of Westinghouse participation in sewage control projects—ranging from special engineering assistance to supplying a complete line of electrical distribution equipment.

Call your nearest Westinghouse office for examples in your own area. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-94962

YOU CAN BE SURE...IF IT'S

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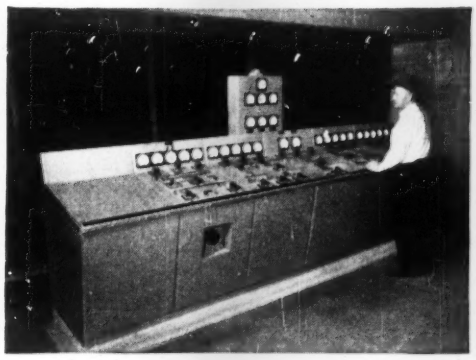
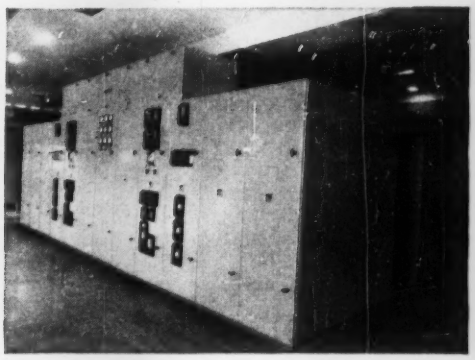


Westinghouse Main Control Benchboard provides finger-tip control of virtually all plant operations. From it, utility and plant power can be controlled through remote switching of feeders and transformers in both systems.



Westinghouse Indoor Metal-Clad Switchgear 4160 volts, is located back to back with similar switchgear which controls utility power supply. Factory assembled and tested, this compact unit installed easily and saved building space.

Chicago outlines improvement program

City board recommends $180.7-million-5-year plan to be financed out of revenue from motor fuel tax

A five-year program of street, highway and sewer improvements totaling $180.7 million has been recommended by a 10-man Engineering Board of Review, in Chicago. The five-year period covers the calendar years 1954-1958, inclusive.

The plan is only a part of the city's public works program. It covers only those improvements that are eligible to receive financing from state motor fuel tax receipts.

Preparation of the long-range improvement program is required by state law adopted in 1949 which provides that ". . . each county, municipality, village and incorporated town, shall prepare and formally adopt a long-range improvement plan with regard to the road and street systems under its jurisdiction." Also, that ". . . no motor fuel tax monies shall be paid until the long-range plan has been approved by the municipality and by the Illinois Department of Public Works."

As shown in the accompanying table, the report also calls for the expenditure of $40.7 million next year on street and highway improvements, sewer construction, traffic signal installations, and a general traffic survey for the entire city.

Projects recommended by the Board of Review generally fall into two classes: Replacement of facilities which are physically and functionally obsolete; and new projects needed to serve an ever-increasing urban traffic volume.

• **Methods of financing**—The report estimates that the city's share of revenue from motor fuel tax in the five-year period from Jan. 1, 1954, to Dec. 31, 1958, will be $95.3 million. Out of this must come about $12.3 million needed for maintenance work not included in the program—leaving $83 million for construction and major repairs.

Bonds approved by public referendum but not sold as yet which can be used for highway improvements, including street lighting, total about $53.3 million.

The city's Department of Subways and Superhighways has paid $3.2 million in excess of its share of the cost of superhighway construction to date—as set up in the three-way agreement by the city of Chicago, Cook County and the state of Illinois. The city will be reimbursed in this amount by both the county and the state.

Unsold bonds that have been approved for sewer construction total $18 million.

The total of these three funds, together with $83 million of estimated motor fuel tax, will furnish $157.5 million for highway improvement, sewer construction and major bridge repairs in the next five years. Additional funds, however, totaling $23.2 million must be made available before the end of 1958 to complete the five-year, $180.7 million program, according to the report.

• **Bridge program**—While the cost of the five-year program is large, its physical features give a better yardstick of the work to be done. For instance, during the next 5 years, the Division of Bridges and Viaducts plans the construction of 17 new bridge or viaduct projects, 9 grade separation projects, major repairs to 45 bridges and viaducts, and eight bridges to be converted to one-man operation.

The 1954 bridge construction program includes 17 new bridges and viaducts; 8 grade separations, of which two are for paving only; major repairs to 32 bridges and viaducts; installation of motor generators on three bridges; conversion of 8 bridges to one-man operation; roadway repairs on 12 bridges; and one tunnel closing. Circumstances, however, may require that some of the projects will have to be omitted and others added due to dire necessity during the year, according to the report.

• **Superhighways**—Work on the comprehensive superhighway system will be carried on jointly by the city, county and state. Funds for this work shown in the accompanying table are those of the city only, for construction and right-of-way.

The report as defined also points out that the entire completion of the Northwest and Southwest Routes undoubtedly will extend several years beyond 1958.

Limited-access expressway construction under the five-year program includes: Northwest Route from the Congress Street Expressway to the northwestern city limits at Canfield Ave., and Montrose to Devon, on the spur connecting with Cook County's Edens Expressway; all of the Congress Street Expressway; Southeast Route from 47th to 59th Streets; Southwest Route from 26th to the western city limits just beyond Cicero; and South Route from Congress

TABLE OF COSTS AND FUNDS

(In thousands of dollars)

Item	Long-range plan 1954-1958, Incl:	Construction for 1954	Funds for items listed: Bonds not sold	Total
Superhighways	$52,850	$14,829	$30,000	$30,000
Bridges, viaducts and R.R. grade separations:	38,592	8,400	13,300	13,300
Sewer construction:	23,670	3,400	17,960	17,960
Street const. & reconstruction:	35,000	6,609		
Street lighting:	15,000	3,764	10,000	10,000
Traffic signals	7,000	954		
Channelization & street grade separations	8,242	2,397		
General traffic study for Chicago:	300	300		
				83,000*
				3,200†
Totals	**$180,654**	**$40,653**	**$71,260**	**$157,460**

* Estimated net five-year motor fuel tax.

† Reimbursement by county and state for superhighway work done by the city.

St. to 26th St. In addition, approximately $4 million will be spent on the Wacker Drive Extension, from Lake St. to Van Buren St.

• **Street improvement**—The Bureau of Streets' list of proposed work under the five-year program is aimed chiefly at improving the arterial system. Considerable attention will be given to those streets that will be converted from street car to bus service. The total program as scheduled, includes the reconstruction and resurfacing of 238 miles of streets during the next five years, 52 miles of which is planned for 1954.

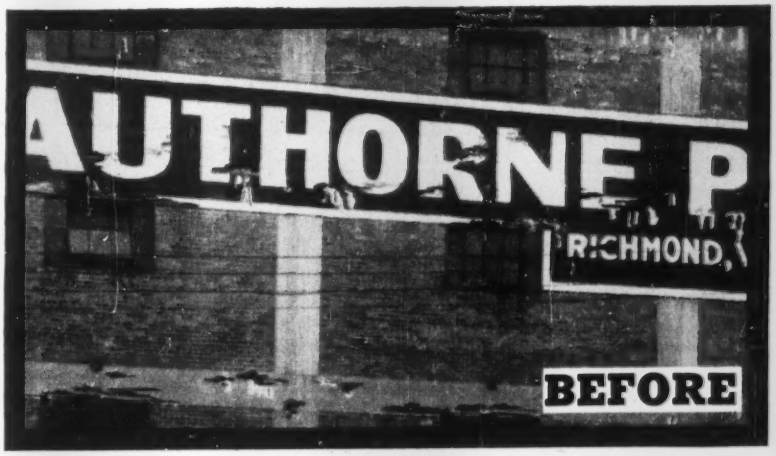
The city's street lighting program for the next five years covers 273 miles, with 64 miles of improved lighting scheduled for 1954. By the end of 1953 improved lighting meeting I.E.S. recommendations and A.S.A. standards will have been installed on 225 miles, leaving 560 miles of arterial streets to be relighted. Modern residential street lighting which is being paid for with bond funds are not included in this program.

The city now has 1,600 traffic signals, but needs at least 1,700 more. The five-year program calls for the installation of 1,094 new signals to go on designated federal aid, state bond and arterial streets.

The city's $23.7-million sewer program is included in its five-year program since legislative action allows a portion of the cost of sewer construction to be charged against motor fuel tax receipts. Construction planned under the five-year program is a continuation of, and supplements, the city's $84-million sewer program adopted in 1945 (ENR, Mar. 22, 1945, v.p. 382).

• **Review Board members**—Lloyd M. Johnson, commissioner of streets and sanitation, serves as chairman of Chicago's Engineering Board of Review. Other board members are: Robert A. Black, chief engineer, Chicago Park District; Ralph Budd, chairman, Chicago Transit Authority; Ralph H. Burke, airport consultant; Roy T. Christensen, commissioner of buildings; Virgil E. Gunlock, commissioner of public works; James W. Jardine, commissioner of water and sewers; Wm. M. Spencer, chairman, Chicago Plan Commission; Wm. H. Trinkaus, chief engineer, Chicago Sanitary District; and Wm. J. Mortimer, superintendent, Cook County (Illinois) Highway Dept.

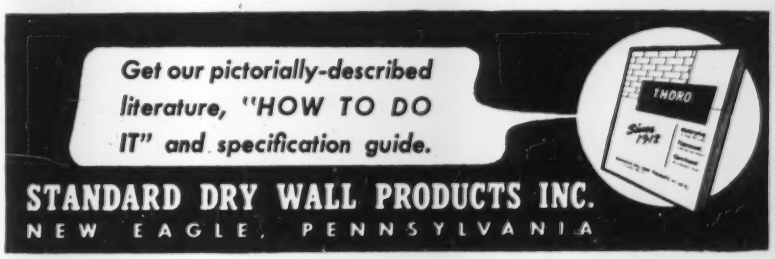
THORITE patching mortar and two THOROSEAL applications rejuvenated this Virginia building



Constant weather exposure over the years caused the masonry of this building to disintegrate. If this unsightly condition had not been corrected it would have finally imperiled the structure of the building.

All concrete spandrel beams, columns, window heads and brick sills were patched and brought flush with surrounding surface by the use of The THORO System product, THORITE, a twenty-minute set, nonshrink, patching mortar. Two brush coats of THOROSEAL were then applied over entire reinforced concrete surfaces, to prevent further disintegration, also to beautify building.

CONTRACTOR: Southern Waterproofing and Concrete Company, Inc., 1704 Arlington Road, Richmond, Virginia.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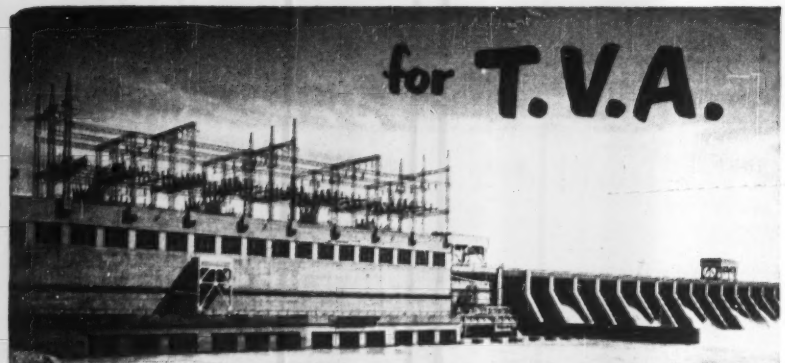
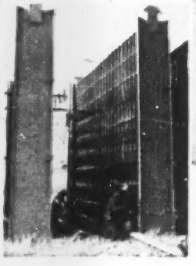


...252 TONS OF INSURANCE



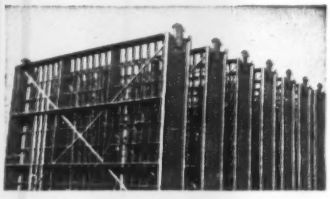
—by special delivery

As a precaution against foreign objects being sucked into turbine propeller blades, in the huge TVA hydroelectric power system, intake water passes through "trash racks."

At Pickwick Landing Dam, there are six propeller turbines of 48,000 H.P. each, activated by the flow of 8,000 to 12,000 cu. ft. of water per second . . . more than 500,000 gallons per minute for each turbine, at full capacity.

To equip units 5 and 6 at Pickwick Landing, International Steel contracted to furnish the Trash Racks. 36 welded steel assemblies were supplied. Half of these were 20 feet square and weighed 8 tons each. The total shipment amounted to 252 tons.

Such unwieldy structures required forethought in handling and shipping. Transportation was by river barge from Evansville direct to destination.



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OBITUARIES

Paul L. Laws, 58, for 31 years an engineer with the Oklahoma State Highway Department, died in Oklahoma City Dec. 7. He was state specifications engineer and previously held such posts as resident engineer, assistant division engineer and urban design engineer. He was a graduate in civil engineering from the University of Oklahoma.

Ward P. Christie, 64, of the engineering division, Bureau of Public Roads, died Dec. 16 at Washington, D. C. He was graduated from Purdue University as a civil engineer in 1915 and served as an officer of the Air Service during World War I. In 1920 he joined the staff of the Associated General Contractors and in 1935 entered engineering service for the government. During the last 10 years he was with the Bureau of Public Roads. He was considered an authority on contract management and construction equipment ownership practices. He developed many of the construction policies and procedures now used and recognized as standard throughout the contracting industry.

James W. Adams, 57, consulting civil engineer, who worked on the design and construction of many large airports, died at Hempstead, N. Y., Dec. 15. A 1925 graduate of Rensselaer Polytechnic Institute, he first joined the Foundation Co. and later became borough engineer for Mountain Lakes, N. J. For a time he was chief engineer, airport division, at the Curtiss-Wright Corp. He was district manager and engineer for Pan American Airways in 1941-42, in charge of the design and construction of two airports in Liberia and West Africa. Latterly he had his own offices as a consultant on airport design.

Kenneth M. Wood, 56, of Milwaukee, Wis., head of the cartographic division of the federal Soil Conservation Service for the eight state regions, with headquarters there, died at Milwaukee Dec. 14. He was a C.E. graduate at Iowa State College and worked with the Illinois and Iowa highway commissions before joining the S.C.S. 18 years ago as an assistant chief engineer on one of the earliest erosion control projects. The cartographic division at Milwaukee, which he headed since its creation in 1939, did a great deal of secret work during World War II on invasion maps made from Army negatives and the Army E, with four stars was presented to the division.

Peruvian colonization gets under way

A contract between the Peruvian government and LeTourneau del Peru, Inc. has been signed for the construction of a 31-mile highway in the Pucallpa region of east-central Peru, and for the initiation of a colonization venture on 1,500 sq miles of forest lands along the Pachitea River. Negotiations for the project have been under way since last spring (ENR July 30, 1953 p. 44).

The land grant is the Peruvian government's compensation to LeTourneau for the construction of the highway. The highway is to be oil-surfaced and will be built with grades and curves in accordance with standard railway practice to provide for the eventual laying of rails on the highway.

Land will be turned over to LeTourneau del Peru as sections of the highway—to be connected with the trans-Andean highway—are completed. LeTourneau will be responsible for all medical, educational, logistical, and transportation requirements of the colony.

Tidal power plant plan pushed by French group

Plans for the construction of a dam to harness tidal flow at the mouth of the Rance River in Brittany, France, are being completed by Electricite de France. The $150-million project would entail the construction of a 2,400-ft long dam between Saint Malo and Dinard at the mouth of the river. Average tide at the mouth of the Rance is 38 ft, and the average head on the Kaplan turbines in the proposed hydroelectric plant would be almost 20 ft.

Feasibility of the project lies in the fact that there would be a storage basin of about 8 sq miles to retain the tidal flow which at mid-tide is 530,000 cfs. Installed capacity of the 26 turbines called for in the plan would be about 240,000 kw.

Under consideration for a number of years, the project has not yet received final approval. Funds for its realization will have to be made available through an appropriation by the French National Assembly.

International briefs . . .

• **African pipeline**—The South African Road Federation, Union of South Africa, plans a petroleum products pipeline from Durban to Johannesburg. Cost of the construction is estimated at $25-million.

• **Rome subway**—Construction of the first trunk line of the Rome subway, long interrupted for lack of funds, has now been resumed with completion scheduled for 1954. When this first part of the program is completed, work on further sections to outlying districts will begin.

• **Spanish port improvement**—One of the most strategically and commercially important ports in Spain, the port of Corunna on the northwest corner of the country, is scheduled for a $7-million improvement. Widening and deepening the harbor is necessary, along with the completion of a new breakwater begun some years ago.

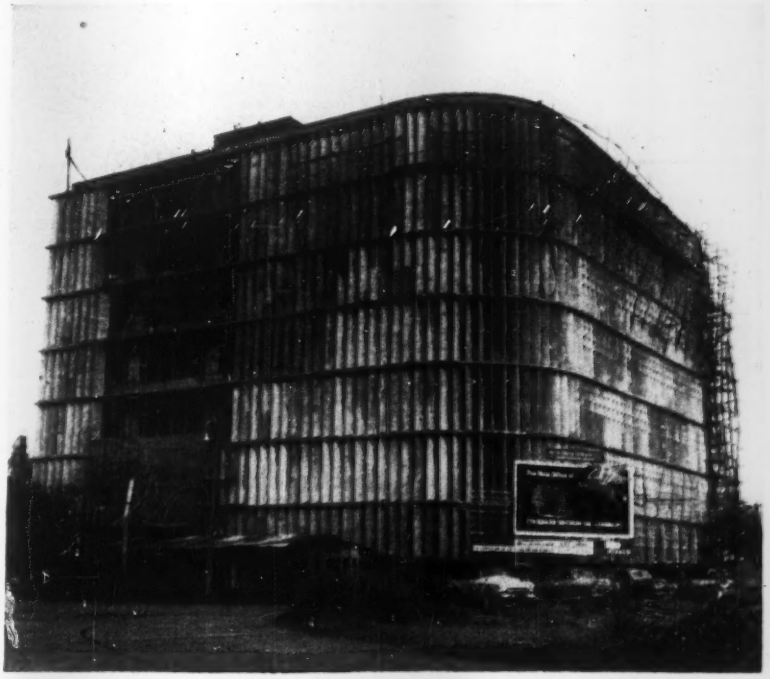
• **West African colony**—In its works program for 1954, the Portuguese government has set aside $12-million for construction in the West African colony of Angola. Among the main projects are harbor construction at Mossamedes, railway extension from Malange to Lui, and improvement of the Angola highway system.

• **To extend factory over river**—Extensions for a factory in Turin, Italy, are to be built out over a river about 100 ft wide. The factory, on the river bank, will extend its operations on a concrete floor set on piles in the river bed. The new floor will cover about 20,000 sq ft and cost $2-million.

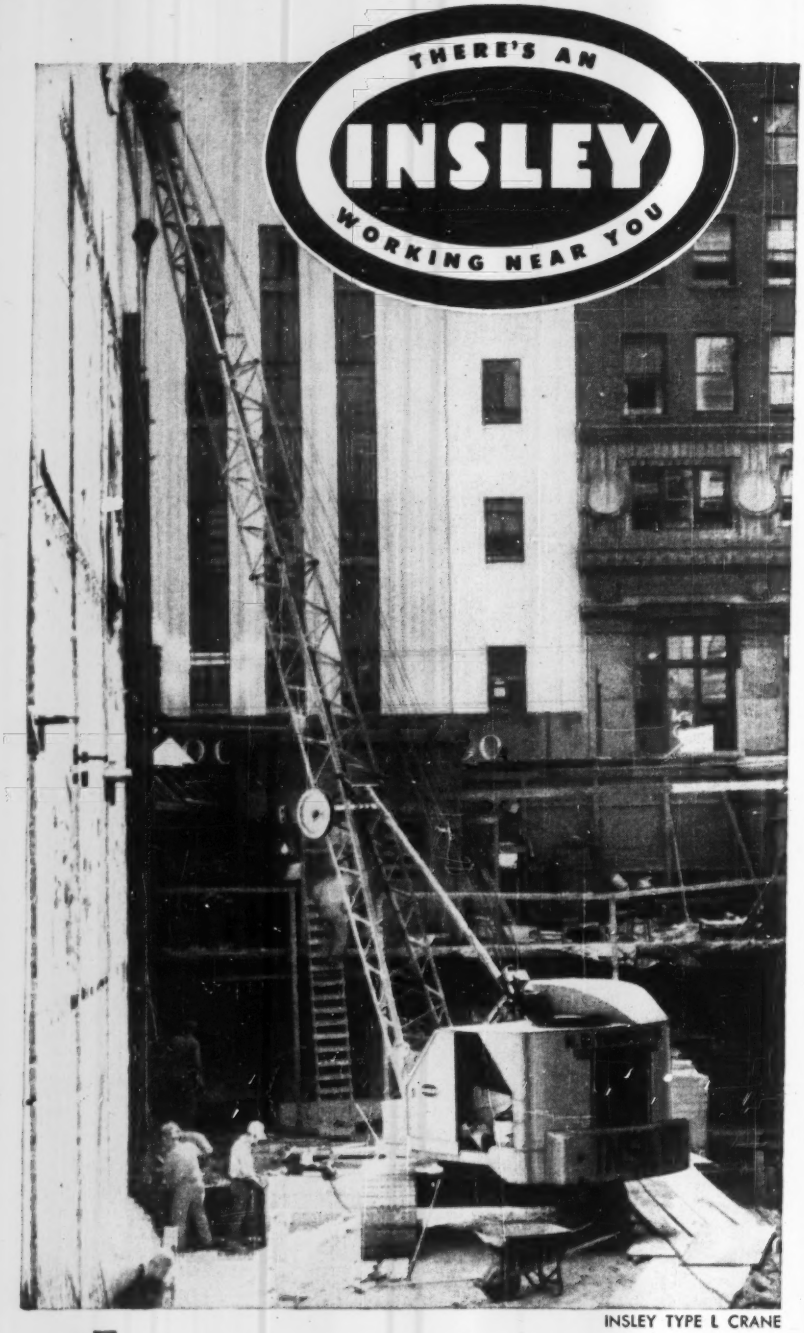
Concrete louvres sheath building

Dedicated this month in Bombay, India, the new $1-million Standard Vacuum building is particularly noteworthy for its louvred control of the sun's heat and glare. Average yearly temperature in Bombay is around 70 deg F. The building is not only air conditioned to circumvent this heat, but its exterior is sheathed in 1,200 louvres to ward off the sun's glare.

The louvres are all precast: the verticals being of concrete, and the horizontal inset louvres, between the verticals, of asbestos cement. Concrete and asbestos cement were chosen partly because of the high humidity in Bombay during the monsoon seasons.



NEW OFFICE BUILDING, in Bombay, India, is protected from glare by 1,200 concrete louvres.



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High cost of work in cost-plus contracts

"A cost-plus contract, so-called, is one wherein one of the parties undertakes to pay all costs incurred by the other party in the performance of the contract and a fixed fee over and above such costs."

A cost-plus contract was entered into for the manufacture of fuel-oil tanks. At the time the contract was entered into, there was a steel shortage and steel fuel-oil tanks were difficult to obtain. The party for whom the tanks were made refused to accept and pay for the same when completed, claiming that the cost of making same were excessive. The action was brought to recover compensation for the tanks on a cost-plus basis. The contractor was allowed a recovery, the court holding: "Though the price was higher than either of the parties expected, the defendant, in the absence of fraud or misrepresentation, cannot now be heard to claim that it was unreasonable."[1]

(1) Continental Copper & Steel Industries, Inc. v. Bloom, Supreme Court of Errors of Connecticut, April 30, 1953.

Damages to buildings

An owner of a partly constructed building employed a contractor to fill in the trenches outside of the walls of the building and to have the lot graded. After this work was done a crack appeared in the rear wall of the building and the owner, claiming that the damage to the wall resulted from it being hit by the bulldozer employed by the contractor while performing the work.

The contractor claimed that the crack in the wall resulted from the pressure that the bulldozer exerted against the earth of the wall of the building which had not been properly supported and which was laid in a muddy trench. The court denied the owner a recovery.[1]

The court in its opinion, quoting from the opinion in the case of Gavbis v. Palm, 93 A. 2d 269, 272, stated: "If a building contractor does his work in accordance with the plans and specifications and without negligence, he will not be liable to the owner where the building is subsequently damaged by reason of some defect in the building or some fault of the soil, in the absence of an express warranty that the plans and specifications are sufficient inasmuch as he does not warrant their sufficiency but only the skill and care with which he performs

his work and the soundness of the materials used therein."

The opinion cites many other cases to sustain this proposition of law and further states: "In Allen v. Kraus, 358 Mo. 520, 215 S. W. 2d 739, defendants contracted to remove earth from one side to the other side of the roof to an underground garage, and vice-versa, so that the roof could be repaired. The term used was to 'stockpile' it there. The roof collapsed because the contractors placed the earth in one pile, instead of several. In holding the contractors liable for failure to use ordinary skill and care the court stressed the fact that the contractors were experienced in that line of work, and the damage would not have occurred if the work had been done in such manner as to distribute the load. In the instant case the work was done according to the owner's directions, the contractor made no representations or warranties, and had no choice of means. There is no evidence that the earth was moved in an unworkmanlike manner."

(1) Kerr v. Millwee et al., 96 A. 2d 1, Court of Appeals of Maryland, April 17, 1953.

Rights of material men

Where a subcontractor had entered into a contract with another party whereby the latter was to furnish certain materials needed for the performance of the subcontract and where the materialman stopped delivering the materials because the subcontractor had failed to pay for materials already delivered, a promise by the general contractor to pay for all materials already delivered and to be delivered in the future is not invalid because the materialman was already under an obligation to furnish said materials under his contract with the subcontractor.[1]

While as a general rule a promise to do something in order to constitute a valid contract must be supported by a consideration—that is, something must be given for what the other party promises to do. In the above case, the failure to make the payments constituted a breach of the contract, and the materialman's promise to deliver the needed materials constituted a sufficient consideration to support the general contractor's promise to pay for the same.

(1) Naples v. McCann, 95 A. 2d 158, Superior Court of New Jersey, Appellate Division, Feb. 27, 1953.

(These summaries of court decisions are prepared by J. Vernon Werbin, New York attorney and civil engineer.)

Sun reflecting aluminum sheets will cover this Wolmanized lumber reservoir roof in Pomona, Calif.

Wolmanized lumber, on steel framing, gives lasting protection and insulation to this Orlando, Fla. reservoir.

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Wolmanized lumber's resistance to rot is largely due to the fact that Wolman* preservative solutions are *forced* deep into the fibers of the wood by high pressures . . . not just brushed on or soaked in. And besides being odorless, Wolmanized lumber is nonoily, clean and completely paintable.

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BOOKS

Traffic control manual

MANUAL OF TRAFFIC ENGINEERING STUDIES—Second Edition. 275 pp. Published by the Accident Prevention Department, Association of Casualty and Surety Companies, 60 John St., New York 38, N. Y. $3.75.

Extremely attractive and concise, this manual is a handy reference for all those who are interested in traffic and traffic problems. It is of utmost value for urban traffic engineers because it embodies practices selected from a nation-wide field—which is full of growing pains.

The manual does not solve problems, but it probably will indicate how to attack a problem without wasting precious time and money on negative trial-and-error methods.

Numerous well chosen illustrations aid in simplifying an otherwise complicated subject. Some of the items covered are: accidents, stop signs, traffic signals, speeds, pedestrians, capacities, traffic volumes, cordon lines, congestion, origin and destination, parking, staggered hours, report writing, spot maps, accident diagrams, volume flow maps, 85 percentile, desire lines, trend curves, future growth, and sampling methods.—*Reviewed by* W. R. BELLIS, *Chief of the Traffic Design and Research Section, Bureau of Planning and Traffic, New Jersey State Highway Department, Trenton, N. J.*

Miscellaneous notes

• **Through research** financed by the Lumber Dealers Research Council, the University of Illinois Small Homes Council developed thin, studless partitions to save space, materials and cost in the enclosure of storage areas. The construction is described in an 8-page pamphlet, which can be obtained for 10¢ from the council, at Mumford House, University of Illinois, Urbana, Ill. In brief, walls are slimmed by using a studless panel made of ¾-in. thick gypsum board bonded with linoleum paste to ¼-in. thick pressed wood. Panels of ¼-in. plywood also are satisfactory. Serving as back walls, these panels are supported by fixed shelves and divider panels and end panels.

• **Structural engineers** should find useful information in "Stress Analysis and Design of Steel Columns," by H. K. Stephenson and Kriss Cloninger, Jr., Bulletin 129, of the Texas Engineering Experiment Station, College Station, Texas. The 287-page booklet summarizes and evaluates the relative importance of the various factors that influence the elastic behavior of compression members, reviews fundamental concepts and furnishes tables and charts for solving problems.

New engineering books

RENEWING OUR CITIES—By Miles L. Colean. 181 pp. The Twentieth Century Fund 1953, 330 W. 42nd Street, New York 36, N. Y.—$2.50.

DESIGN IN STRUCTURAL STEEL—By John E. Lothers. 454 pp. Prentice-Hall Inc., 70 Fifth Ave., New York 11, N. Y. $10.00.

APPLIED ELASTICITY—By Chi Teh Wang, Sc.D. 357 pp. McGraw-Hill Book Co., 330 W. 42nd Street, New York 36, N. Y. $8.00.

FLOOD CONTROL POLITICS—By William Edward Leuchtenburg. 339 pp. Harvard University Press, Cambridge 38, Mass. $5.00.

Reports and pamphlets

PROCEEDINGS OF THE FIFTH HYDRAULIC CONFERENCE—Bulletin 34, Iowa Institute of Hydraulic Research, State University of Iowa, Iowa City, Iowa. $3.50.

CONTROL OF QUALITY OF READY-MIXED CONCRETE—Publication No. 44, National Ready Mixed Concrete Association, 1325 E Street, N. W., Washington 4, D. C.

SHOPPING CENTERS: Principles and Policies—Technical Bulletin No. 20, Urban Land Institute, 1737 K St., N. W., Washington 6, D. C. $6.00.

THE TSUNAMI of November 4, 1952 AS RECORDED AT TIDE STATIONS—Special Publication No. 300, U. S. Department of Commerce, Coast and Geodetic Survey. Superintendent of Documents, Washington 25, D. C. 35c.

BIBLIOGRAPHY ON SULFATE RESISTANCE OF PORTLAND CEMENTS, CONCRETES AND MORTARS—Paper No. 708, Miscellaneous Journal Series, University of Minnesota, Minneapolis, Minn.

HOUSING AND BUILDING IN HOT HUMID AND HOT DRY CLIMATES—Research Conference Report No. 5, Building Research Advisory Board—2101 Constitution Ave., Washington, D. C. $6.00.

A RECOMMENDED LIST OF BASIC PERIODICALS IN ENGINEERING AND THE ENGINEERING SCIENCES—Monograph No. 9, Association of College and Reference Libraries, c/o University of Illinois Library, Chicago Undergraduate Division, Chicago 11, Ill. 75c.

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

SOON LETS CONTRACT—BUILDINGS

Mass., Medford—WAREHOUSE, etc.—U. S. Plywood Corp., 57 Mystic Ave., Somerville, soon lets contract, 55,000 sq. ft., concrete, brick, block warehouse, offices, Mystic Valley Parkway. $400,000. Johnson & Whitcomb, 44 Brattle St., Cambridge, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† F. D. Rich Co., 322 Main St., Stamford, Conn. CA $2,541,250, est. $3,000,000 double cantilever maintenance hangar, Westover Air Force Base, ENG-19-016-54-32, CHICOPEE FALLS, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 11/25, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ State University of Mass., Kenneth W. Johnson, treas., Amherst, Mass., rejected bids Nov. 20. PUBLIC HEALTH BLDG. Proj. U-301. State University, AMHERST, MASS. LB $1,526,184. CD 11/25, under LB.

Concrete Constr. Co., 11 Garfield Ave., Chelsea, Mass. LB $775,000. Mass. No. 200-3 veterans HOUSING, 64 units, Cherry St., EVERETT, MASS. Everett Housing Auth., 48 Elm St., Boston, Mass. Bids Dec. 11. CD 11/30.

▲ Park Constr. Co., Inc., 40 Court St., Boston, Mass. CA $1,114,000, est. $1,000,000. Junior High SCHOOL, Village St., MARBLEHEAD, MASS. Town, Aura W. Coleman, supt. SCHOOLS, Town Hall, Marblehead, Mass. CD 12/8, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. Y., Mineola—B.A. 1/5—Bd. Supervs. Nassau Co., Old Court House, Mineola, Contr. 1082-B, road imprvs. Freeport. $213,290. CD 12/7/45.

▲† N. Y., Plattsburg—DORMITORY, etc. B.A. 3/30—U.S. Eng., 80 Lafayette St., New York, Zone 13, AM dormitory and mess and commissary bldg. (FY 53). $1,000,000-$3,000,000. Seelye, Stevenson, Value & Knecht and Shreve, Lamb & Harmon, 101 Park Ave., New York, Zone 17, engrs.-archts. CD 10/15/52.

▲† N. Y., Niagara Falls—NATIONAL GUARD FACILITIES—B.A. 4/27—U.S. Eng., 80 Lafayette St., New York, Zone 13, air national guard facilities, Niagara Falls Air Force Base. $1,000,000-$3,000,000. Brown, Guenther & Booss, 1860 Broadway, New York, archts. CD 10/16/52.

BIDS ASKED—BUILDINGS

N. Y., Rocky Point—SCHOOL—B.A. 1/4—Bd. Educ., Common School Dist. 9, Rocky Point, elementary school. $600,000.

▲ N. Y., Great Neck—SCHOOL—B.A. 1/12—Bd. Educ., Union Free School Dist. 7, Lake Success, grade school. $1,725,000. CD 6/15/50.

SOON LETS CONTRACT—BUILDINGS

▲ N. J., Yardville—MILL—Hightstown Rug Co., Hightstown, soon lets contract velvet mill. $2,250,000. James C. Flaherty, Denham, Mass., archt. CD 10/14.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Crump, Inc., 4031 Bigelow Blvd., Pittsburgh, Pa., CA Approx. $260,000, swimming pool and filter house, near MURRAYSVILLE, PA. Westmoreland Country Club, Union Trust Bldg., Pittsburgh, Pa. Harry H. Lefkowitz, 504 Standard Life Bldg., Pittsburgh, Pa., archt.

Myers & Quigg, Inc., 91 O St. S.E., Wash., D. C., LB $139,238, c. conc. roadways, alley pavements and sidewalks at various locations, WASH., D. C. D. C. Govt., Director Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids Dec. 9.

BUILDINGS

LOW BIDS AND CONTRACTS

W. L. Blanchard & Co., 45 Pioneer St., Newark, N. J., CA $350,000, 2 story MANUFACTURING and OFFICE BLDG., Fourth St., HARRISON, N. J. Hyatt Bearings Div. of General Motors Corp., Harrison, N. J.

SOUTH

BIDS ASKED—BUILDINGS

Va., Buena Vista—HIGH SCHOOL—B.A. 1/15—Buena Vista School Bd., Buena Vista, Va., Parry McIlwee High School addn. $300,000. Plans deposit $50. Hinnant, Hinnant & Harper, Lynchburg, archts. CD 11/18/52.

▲ Va., Portsmouth—HOUSING—B.A. 1/19—Portsmouth Redevelopment & Housing Auth., 1900 Columbus Ave., 2 story, 515 unit, masonry, concrete housing. $4,250,000. Plans deposit $50. Extended date. Williams, Coile & Blanchard, 424 Dinwiddie St., archts. CD 12/9.

SOON LETS CONTRACT—BUILDINGS

Va., Norfolk—OFFICE—National Bank of Commerce, 300 Main St., soon lets contract 2 story basmnt., masonry Colonial Ave. Office Bldg. $350,000. T. David Fitz-Gibbon, Royster Bldg., archt. CD 9/9/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† Diamond Constr. Co., Little Creek, Norfolk, Va. LB $167,604, guard and guide walls on Lock and Dam No. 2, Cape Fear River, Elizabethtown, Inv. 54-7, NORTH CAROLINA. U. S. Eng., 308, Customhouse, Wilmington, N. C. Bids Dec. 1. CD 11/9.

MISSISSIPPI—State Hy. Dpt., T. C. Robbins, dir., Jackson,

W. S. Corley & Sons, Raleigh, Miss. CA $124,228, est. $130,000, toll collection facilities and misc. constr. for bridges across East and West Pascagoula Rivers on U. S. Hy. 90, Toll Proj. No. II, Contr. V, Jackson Co. Bids Dec. 15. CD 12/4.

MISSISSIPPI—State Hy. Dpt., T. C. Robbins, dir., Jackson,

Boyd Constr. Co., Grenada, Miss. CA $310,346, est. $330,000, grade, drain, culverts, bridges 13.569 mi. Miss. Hy. 27 between Tylertown and Monticello, Proj. S 0184 (2) A, Lawrence Co.;

Dickerson & Bowen, Brookhaven, Miss. CA $266,984, est. $360,000, double bit. surf. tr. 4.754 mi. U.S. Hy. No. 45 between Aberdeen and Nettleton, Proj. F 002-4 (1), Monroe Co. Bids Dec. 15. CD 12/4.

▲ R. P. Farnsworth & Co., Inc., 1515 S. Salcedo St., New Orleans, La. LB $2,377,000. Belle Chasse Tunnel, incl. ramps, ventilation bldgs., approach and service roads and appurtenances under Algiers Cut-Off Canal on State Rte. No. 31, S.P. 62-02-22, Plaquemines Parish, LOUISIANA. State Hy. Dpt., Highway Office Bldg., Baton Rouge, La. Bids Dec. 6. CD 11/12.

BUILDINGS

LOW BIDS AND CONTRACTS

Charles W. Barger & Son, Lexington, Va., CA Approx. $300,000. FINE ARTS and ACADEMIC BLDG., LEXINGTON, VA. Washington & Lee University, Lexington, Va. Bids Dec. 3. CD 12/3.

Thorington Constr. Co., P.O. Box 10, Richmond, Va. CA Approx. $300,000. TELEPHONE BLDG. addn., NORFOLK, VA. C & P Telephone Co. of Va., 703 E. Grace St., Richmond, Va. Bids Dec. 1. CD 11/24.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

Kemmons Wilson, Inc., 4485 Summer St., Memphis, Tenn. Owner Builds. $400,000. 21 four-bedroom RESIDENCES, N. Graham Subdivision, MEMPHIS, TENN.

Boone Cnty. Co., 3rd Natl. Bank Bldg., Nashville, Tenn. CA $400,000. SURGERY BLDG., NASHVILLE, TENN. Vanderbilt University, Nashville, Tenn. CD 2/12.

MIDDLE WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

L. A. Wells Constr. Co., 1211 Schofield Bldg., Cleveland, O. CA $198,700, est. $212,680, sea wall, SR 2-19.50, A UI-529 (11), Cuyahoga Co., OHIO. State Hy. Dpt., Columbus, O. Bids Dec. 8. CD 11/25.

▲ OHIO—State Hy. Dpt., State Office Bldg., Columbus,

C. E. Edgington & Son, 1220 S. Main St., Findlay, O., CA $166,371, est. $174,000, 1.437 mi. SR 29-(5.19) (7.16), 8-110 (3), Auglaize Co.;

Nelson T. Bahan, 549 E. Court St., Urbana, O., CA $146,082, est. $163,500, 1.525 mi. SR 29-(15.33-16.05), S 1119 (1), Champaign Co.;

Arthur S. Langenderfer, Inc., 4690 W. Bancroft St., Toledo, O., CA $869,714, est. $919,000, 8.708 mi. USR 24-18.59, (0.00-8.63), F 487 (5), Defiance and Henry Counties;

Vicintina & Co., 1315 Edgehill Rd., Columbus, O., CA $2,160,000, est. $2,356,100, 1.168 mi. USR 33-(14.45-14.92); SR 782-0.30, U 233 (4), Franklin Co.;

Robert J. Dienst & Son, 297 S. High St., Columbus, O. CA $234,900, est. $255,050, 3.435 mi. CR 27, S-234 (1), Franklin Co.;

W. H. Ringwald & Sons Co., Inc., 42 E. Second St., Chillicothe, O., CA $373,000, est. $391,350, 1.401 mi. USR 50-16.89, F-624 (6), Highland Co.;

Hinton Constr. Co., 638 N. Main St., Celina, O. CA $368,379, est. $382,200, 4.387 mi. SR 48-18.57, 0.00, S-117 (1), Miami and Shelby Counties;

Claude Britton, 405 W. Atwood St., Galion, O., CA $74,495, 0.284 mi. CR 215, S-207 (6), Richland Co.;

Harper Constr. Co., 2916 E. Highland Ave., Cincinnati, O., CA $329,758, est. $305,650, 0.965 mi. USR 23-(10.17-10.76), AA 11 (2), Scioto Co.;

Wren Reese, 535 W. Washington St., Napoleon, O., CA $119,753, est. $146,200, 0.643 mi. SR 116-(10.68) (16.10), S-1142 (1), Van Wert Co.; CA $70,680, est. $70,000, 0.243 mi. SR 116-(20.00-20.06), Van Wert Co.;

A. J. Baltes, Inc., 11 Olive St., Norwalk, O., CA $502,409, est. $527,000, 2.38 mi. USR 6-20.06; USR 23-(14.52) (15.67), F-1007 (1), F-1002 (3), Wood Co.;

Oyler Bros., Inc., 1342 Second St. S.W., Canton, O. CA $129,673, est. $144,200, 0.541 mi. USR 30-9.41, Ashland Co.; CA $123,531, est. $153,000, 0.445 mi. SR 212-9.64, (1.49-1.65), Stark and Tuscarawas Counties;

John G. Witten, Sardis, O., CA $73,069, est. $69,100, 0.193 mi. SR 148-(13.64-15.73), (16.06), Belmont Co.;

The Kelley & Meyer Co., 1211 Gibson St., Youngstown, O. CA $126,556, est. $144,500, 3.686 mi. SR 164-25.28, 0.00, Columbiana and Mahoning Counties;

C. C. Plumley, D.B.A. Plumley Trucking & Excavating Contractors, 184 S. Main St., Marion, O., CA $234,690, est. $243,900, 1.191 mi. SR 229-(1.10-1.32) (3.15), Delaware Co.;

Ohio Eng. Co., 405 Sixty St., Lorain St., Lorain, O. CA $186,297, est. $202,000, 7.951 mi. USR 20-1.78, Lorain Co.;

The Mansfield Asphalt Paving Co., Rear 153 Orange St., Mansfield, O., CA $216,786, est. $245,700, 6.249 mi. USR 42-19.48, Morrow Co.;

Liden Co., Box 117, Nelsonville, O., CA $63,469, est. $79,400, 0.54 mi. SR 540-6.01, Muskingum Co.;

Menuez & Skemp, W. Jackson St., Millersburg, O. CA $72,601, est. $81,500, 0.236 mi. SR 513-(5.06) (9.12-9.18), Noble Co.;

Philip Skinner, Rte. No. 1, Bethesda, O., CA $85,076, est. $108,150, 0.558 mi. SR 566-(0.78) (1.59), Noble Co. Grand total $6,227,288. Bids Dec. 8. CD 11/25.

▲ MICHIGAN. Mackinac Bridge Auth., 700 Olds Tower, Lansing,

Merritt-Chapman & Scott Corp., 260 Madison Ave., New York 16, N. Y. CA $25,735,600, substructure;

American Bridge Div., U. S. Steel Corp., 71 Broadway, New York 6, N. Y. CA $44,532,900, superstructure 5 mi. bridge over Mackinac Straits, incl. 4 traffic lanes and 3,800 ft. main span. CD 3/3/53, under CA.

BUILDINGS

LOW BIDS AND CONTRACTS

Mintz Constr. Co., 1946 Lee Rd., Cleveland Heights, O. Owner Builds. $300,000. 2 story, partial bsmnt., 13,000 sq. ft. masonry OFFICE, air-conditioning, De-

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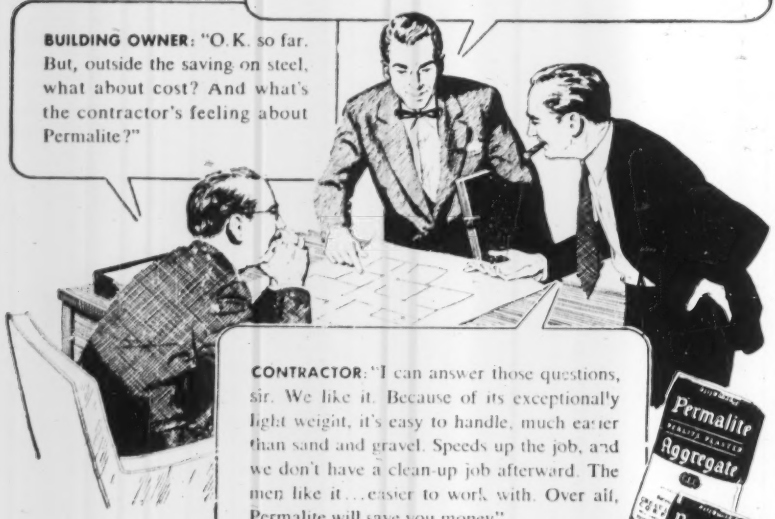

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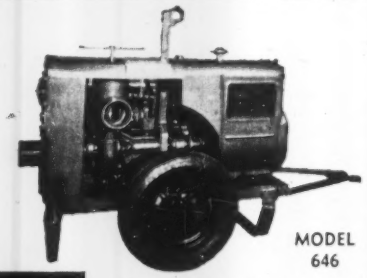

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troit and Mars Aves., LAKEWOOD, O. Irving D. Robinson, 4300 Euclid Ave., Cleveland 3, O., archt.

▲ **Brown & Kerr,** 228 N. LaSalle St., Chicago, Ill., CA $907,791, roofing, ventilators and related constr. work on process bldg. and sub-stations;

Corrugated Asbestos Contractors, 5363 Tchoupitulas St., New Orleans, La., CA $215,940, siding for a process bldg.;

Standard Asbestos Mfg. & Insulating Co., 410 N. Olive St., Kansas City, Mo., CA $54,130, insulated panels, siding and roofing for sub-station;

York Corp., 659 E. 6 St., Cincinnati, O., CA $67,952, refrigeration sys. for process bldg.;

Builders-Providence, Inc., 345 Harris Ave., Providence, R. I., CA $23,483, venturi tubes for a pump house;

Fairbanks Morse & Co., 49 Central St., Cincinnati, O. CA $372,408, water pumps for pump house;

Lehr Iron & Steel, Inc., 655 W. Wilbeth Rd., Akron, O. CA $74,796, steel stairs and stair enclosure material for process bldg.;

Jamar-Oilmen Co., Chicago, Ill., CA $34,929, aluminum exhaust elbows for process bldg.;

Industrial Communication Co., 6539 Linwood St., Detroit, Mich., CA $13,288, intercommunication sys. for 7 bldgs.;

The Monitor Controller Co. (Div. of Ultrasonic Corp.), 51 Hayward St., Boston, Mass., CA $35,119, control panel assemblies for process bldg.;

American Blower Corp., American Bldg., Cincinnati, O. CA $22,293, process bldgs. ventilating fans;

Buffalo Forge Co., 490 Broadway, Buffalo, N. Y. CA $441,375, process bldgs. ventilating fans;

Joy Mfg. Co., New Phila., O., CA $164,472, process bldgs. ventilating fans;

Glazer Steel Corp., 2100 Ailor Ave. N.W., Knoxville, Tenn., CA $62,103, process building diffuser supports for Gaseous Diffusion PLANT (Subcontractors under Peter Kiewit Sons Co., P.O. Box 268, Portsmouth, O.) for Atomic Energy Comm., 1901 Constitution Ave. N.W., Wash., D. C., PIKETON and WAKEFIELD, O. Grand total $2,490,079. CD 8/13/52, under CA.

▲ **Geo. Sollitt Constr. Co.,** 109 N. Dearborn St., Chicago, 2, Ill., CA, $1,854,416, general contract;

William Pope Co., 26 N. Jefferson St., Chicago, Ill., CA, heating work;

Reliable Sheet Metal Works, 1742 W. Carroll St., Chicago, Ill., CA, ventilation work;

Powers Regulator Co., 3819 N. Ashland St., Chicago, Ill., CA, temperature controls;

Inland Pipe & Boiler Covering Co., Chicago, Ill., CA —pipe and equipment coverings;

Hultgren Electric Co., 5242 N. Damen St., Chicago, Ill., CA, electrical work;

Otis Elevator Co., 600 W. Jackson St., Chicago, Ill., CA, elevators, for two 9 story APARTMENTS, one on 31 St. and Michigan Ave. and other on 31 St. and Wabash Ave., CHICAGO, ILL.; Illinois Institute of Technology, 35 W. 33 St., Chicago, Ill. Total $2,280,000. Bids Nov. 30. CD 12/7, under LB.

▲ **Poirot Constr. Co.,** 2001 Pershing Rd., Chicago, 9, Ill., LB, $2,503,700, private pavilion and PROFESSIONAL SERVICE BLDG., CHICAGO, ILL.; Michael Reese Hospital, 30 and Ellis Sts., Chicago, Ill. Bids Dec. 8. CD 11/13.

▲ **Frank Munao,** 1447 Bonnie Brae, River Forest, Ill., Own Forces, $1,000,000. 70 HOMES along Caldwell Ave. and Waukegan Rd., NILES, ILL. Robt. L. Shoyer, 4709 Deming Pl., Chicago, Ill., archt.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Hersom Constr. Co., Laurens, Ia., LB, $260,000 power lines and sys. imprvs., Buena Vista Co., IOWA, Buena Vista County Rural Electric Co-operative, Storm Lake, Ia. Brown Eng. Co., 322 K of P Bldg., Des Moines, archt. and engr. CD 11/6.

† **Seth E. Geim,** Land Bank Bldg., Springfield, Mo. LB $423,700. AFRTC admin. and training bldg., Grandview Air Force Base, Inv. 23-026-54-31, GRANDVIEW, MO. U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. Bids Dec. 11. CD 11/9.

B. R. Gardner, 207 N. Lincoln St., Amarillo, Tex. LB $194,339, est. $235,000, 4 m.g.d. filter plant, SNYDER, TEX. City, c/o B. H. Shelley, city mgr., Snyder, Tex. Bids Dec. 12. CD 11/23.

Tellepsen Constr. Co., 1710 Telephone Rd., Houston, Tex. CA $147,789, Line A exten. drainage ditch enclosure, TEXAS CITY, TEX. Town, Texas City, Tex. Bids Oct. 7, awarded Dec. 11. CD 12/2, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Barnhart Bros. Constr. Co.,** 1130 W. 27 St., Kansas City, Mo. Owner Builds. $1,500,000. 150 DWELLINGS, Santa Fe Acres Proj., INDEPENDENCE, MO.

Shelton & Son, 6204½ Maple St., Omaha, Neb., CA $395,741, general constr. CHURCH and SCHOOL, OMAHA, NEB. Christ The King Parish, 88 and Shamrock Rd., Omaha, Neb. L. A. Daly Co., Insurance Bldg., Omaha, Neb., archt. Bids Dec. 1.

Yarbrough Constr. Co., 5 and Navasota Sts., Austin, Tex. CA $657,015, general constr., general medical and surgical bldg. at Austin State HOSPITAL, AUSTIN, TEX. Bd. for Texas State Hospitals & Special Schools, 45 and Lamar Sts., Austin, Tex. Bids Dec. 10, awarded Dec. 14. CD 12/16, under LB.

Albert Smith, 1109 Currie St., Fort Worth, Tex., LB $391,831, SCHOOL and RECTORY, SISTERS RESIDENCES, FORT WORTH, TEX. Diocese of Dallas, St. Andrews Parish, 5100 Ross St., Dallas, Tex. Boese & Harkrider, T & P Bldg., Fort Worth, Tex., archts. and engrs. Mullen & Powell, Reserve Loan Life Bldg.,

Dallas, Tex., and L. E. Kanto, N. P. Anderson Bldg., Fort Worth, Tex., engrs. Bids Dec. 7.

Plumb-Mitchell Lumber Co., 4550 Griggs Rd., Houston, Tex. Own Forces. **$335,000**, 30 frame, brick DWELLINGS, concrete slab fdn., HOUSTON, TEX. CD 11/25.

H. L. Lockhart, 203 Carson St., Houston, Tex. CA **$750,000**. SHOPPING CENTER UNIT, HOUSTON, TEX. Brace & Carruth, 706 Garden Oaks St., Houston, Tex. Herbert Caldwell, 707 Hughes St., Houston, Tex., archt. CD 1/7/52.

McKinney Independent School Dist., McKinney, Tex. rejected bids Oct. 6, brick, concrete J. W. Webb Elementary SCHOOL addn., **McKINNEY, TEX. est. $300,000**. CD 9/10.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Calif., Petaluma—B.A. 1/19—U. S. Eng.**, 180 New Montgomery St., San Francisco, sewage treatment plant extension of outside utilities, incl. sludge bed, evaporation pond, Imhoff tank, manholes, etc., and inst. and correct various utility lines, earthwork, paving at Two Rock Ranch Station. Extended date. CD 12/2.

BIDS ASKED—BUILDINGS

Wash., Ellensburg—ARMORY—B.A. 1/11—H. E. Pike, state superv. of Purch. Olympia, armory addn. for Dpt. Army, Wash. National Guard, Serial No. DA-45-113-NG-51. Lance, McGuire & Murri, 319 S. 7 St., Tacoma, archts.

Wash., Moses Lake—HOSPITAL—B.A. 1/20—Moses Lake Hospital District, Moses Lake, 2 story, part bsmt., 109x270 ft., rein.-con., steel hospital, $620,000. Plans deposit $50. H. A. Hovind, 1500 Westlake Ave. N. Seattle, and C. Martell, Fernwell Bldg., Spokane, archts. Extended date. CD 11/25.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Elliott Constr. Co.**, 503 Redick Tower, Omaha, Neb., LB, **$427,940**, est. $546,105, transmission lines from Saguaro Steam electric station to Photenix-Tucson No. 2 tap, ED 5 Sub-station and Oracle Sub-station, Davis Dam Proj., Spec. DC-4072, ARIZONA, Bureau Reclamation, Dpt. Interior, Phoenix, Ariz. Bids Dec. 4. CD 11/2.

▲ † **United Concrete Pipe Corp.**, 14041 E. Arrow Hy., Baldwin Park, Calif., CA **$1,063,159**, earthwork, pipe lines, structures for Area P-4 laterals (Block 13) Potholes East Canal laterals, Columbia Basin Proj., Spec. DC 4001, WASHINGTON Bureau Reclamation, Dpt. Interior, Ephrata, Wash. Bids Nov. 12. CD 11/20, under LB.

▲ † **English Electric Export & Trading Co.**, 23 Beaver St., New York, N. Y. CA **$3,651,476**, two 73,684-kv generators for Units 13 and 14, McNary Dam, Inv. 54-17, OREGON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Oct. 27, awarded Dec. 15. CD 11/4, under LB.

▲ **CALIFORNIA**—Div. of San Francisco Toll Crossings, 2054 University Ave., Berkeley,

Newbery Electrical Corp., 1038 Venice Blvd., Los Angeles, Calif., CA, **$1,020,938**, electrical and mechanical work for Richmond-San Rafael Bridge for approaches, toll plaza bldgs., bridge structure, Marin and Contra Costa Counties. Bids Dec. 1, awarded Dec. 9. CD 12/9, under LB.

† **H. Earl Parker**, 12 and F Sts., Marysville, Calif. LB, **$311,890**, Alternate **$296,595**, levee enlargement, bank protection, right bank of Sacramento River and Sutter Slough on Merritt Island, Spec. 1813, CALIFORNIA. U. S. Eng., Wright Bldg., Sacramento, Calif. Bids Dec. 8. CD 11/25.

CALIFORNIA—State Div. Hys., P.Wks. Bldg., Sacramento,

Clyde W. Wood & Sons, Inc., P.O. Box 602, North Hollywood, Calif., LB, **$503,459**, grading, surf. 6.3 mi., widening bridge between Jackson and 1 mi. west of Pine Grove, Amador Co.;

Frederickson & Watson Constr. Co., 873 81 Ave., Oakland, Calif., LB, **$547,453**, grading, paving, ramps, 2.4 mi. San Luis Obispo between Marsh St. and San Luis Obispo Creek, San Luis Obispo Co. Bids Dec. 9. CD 11/20.

CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,

Fredericksen & Kasler, 212 13 St., Sacramento, Calif., CA, **$566,071**, grading, surf. 4.1 mi., rein.-con. slab bridge between 0.5 mi. W and Rt. 155 and Conejo Grade Summit, Ventura Co. Bids Nov. 27, awarded Dec. 10. CD 12/9, under LB.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

Teichert & Son, Inc., 1931 Stockton Blvd., Sacramento, Calif., CA, **$737,583**, grading, frontage roads, overcrossing 10.1 mi. between Ben Ali and 1 mi. south of Roseville, Sacramento and Placer Counties. Bids No. 24, awarded Dec. 7. CD 12/2, under LB.

Arthur Brothers, 29 Vista Ave., San Mateo, Calif., LB, **$386,716** sewage works enlargement, SAN MATEO, CALIF. City, City Hall, San Mateo, Calif. Bids Dec. 7. CD 11/20.

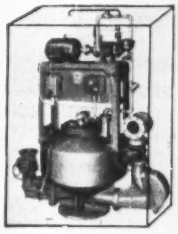
† **Fredericksen & Kasler**, 229 E. 19 St., San Bernardino, Calif., CA, **$609,626**, runway, taxiway exten., etc., ENG-04-353-54-29, VICTORVILLE, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Dec. 1. CD 12/2, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Fullmer Bros., 1600 Jefferson St., Salt Lake City, Utah, CA, **$624,500**. RELIEF SOCIETY BLDG., SALT LAKE

BRIEFS from The YEOMANS GUARD



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CITY, UTAH, Latter-Day Saints Church, 47 E. South Temple St., Salt Lake City, Utah. Bids Dec. 3.

Walker Boudwin Constr. Co., 624 E. 4th St., Reno, Nev., CA, Est. $617,000. 4 story, rein.-con. TEMPLE addn., 40 W. First St., RENO, NEV. Masonic Temple, c/o contractor.

Skagit Steel & Iron Works, Sedro-Wooley, Wash., Day Labor, $300,000, MACHINE SHOP addn. to produce ordnance items, SEDRO-WOOLEY, WASH. CD 8/17.

MacDonald, Young & Nelson, Inc., 351 California St., San Francisco, Calif., LB, $720,000, CAFETERIA, San Francisco City College, SAN FRANCISCO, CALIF. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids Dec. 9. CD 11/25.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

J. S. Quinn Constr. Co., 999 Erin St., Winnipeg, Man., CA, $159,400, Contract No. 1, Carrott River Dyking, The Pas.

W. C. Wells Constr. Co. Ltd., 140 Ave. F N., Saskatoon, Sask., CA, $109,200, 80,000 cu. yd. stripping, 820,000 cu. yd. earth fill and extra work on dyke, Pasquino River, The Pas, MANITOBA. Prairie Farm Rehabilitation Admin., Regina, Sask. CD 12/13/44.

R. E. Stewart Constr. Corp., 362 Wellington St., Sherbrooke, Que. CA, $146,000, combined parachute safety equip. and workshop bldg., R.C.A.F. Station, BAGOTVILE, QUE. Defence Constr. Ltd., 1247 Guy St., Montreal, Que. Bids Nov. 24. CD 10/28.

BUILDINGS

LOW BIDS AND CONTRACTS

Angus Robertson Ltd., 57 Bloor St. W., Toronto, Ont., CA, $318,000, 3 storage silos, 2 story, rein.-con., steel masonry office and scale bldg., 54 Polson St., TORONTO, ONT. Canada Cement Co. Ltd., 50 King St. W., Toronto, Ont. Awarded Dec. 10.

Belle Constr. Lee., St. Joseph d'Alma, Que., CA, $334,400, SCHOOL and RESIDENCE, ISLE MALIGNE, QUE. School Commission of Isle Maligne, Que. CD 11/24.

LATIN AMERICA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Le Tourneau del Peru, Inc.**, Lima, Peru, and c/o LeTourneau Technical Institute, P.O. Box 2307, Longview, Tex., U. S. A., CA. constr. 50-kilometer hy. between Trans-Andean Hy. and Pachitea River, PERU. Govt. of Peru, Lima, Peru.

Proposed Projects

WATER SUPPLY

Ill., Hinsdale—Village, WW rehabilitation and addns. $500,000. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Zone 6, consult. engrs.

▲ **Ill., Zion**—Lake County Water Bd., water mains, reservoir, Gravel Pack Water Collection Unit. $1,100,000. DeLeuw, Cather & Co., 150 N. Wacker Dr., Chicago, Zone 6, consult. engrs.

▲ **O., Stow**—Comrs. Summit Co., Court House, Akron, water line sys. to approx. 2,600 homes and homesites, Stow Twp. area; install mains and trunk main to connect with line between Akron and Lake Rockwell; 600,000 gal. standpipe, $1,050,000. Leslie G. Wolfe, Co. engr. CD 10/6/50.

▲ **Okla., Muskogee**—City, City Hall, 36 in. c.i. water flow line from Ft. Gibson to Muskogee, $2,000,000. Lyman Beard, c/o owner, engr.

▲ **Tex., Nacogdoches-Lufkin**—Nacogdoches-Lufkin Water Assn., c/o Thos. E. Baker & H. J. Shands, Nacogdoches, lake proj., constr. dam across Angelina River, 45,000 acres land involved in lake area for furnishing domestic water supply. $1,000,000.

▲ **Tex., Rusk, Jacksonville and Palestine**—Upper Neches River Auth., Jacksonville, dam and reservoir to cover 21,000 acres, contain more than 400,000 acre. ft. water, to provide domestic water supply to three towns, viz Rusk, Palestine and Jacksonville. $9,000,000. Brown & Root, Inc. Eng. Div., Box 3, Houston, consult. engr.

Ont., Toronto—Pickering Twp., L. T. Johnston, clk., Brougham, ratepayers voted in favor water system incl. infiltration gallery, 23 mi. mains, 16 in. feeder main and 12 in. main, $965,000. Proctor, Redfern & Laughlin, 11 Jordan St., consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Fla., Bradenton**—City, City Hall, voted $2,000,000 bonds Dec. 8, sewage disposal plant and other sewer imprvs. CD 3/24.

▲ **Fla., Hollywood**—City, voted bonds Dec. 8, sanitary sewers, $2,000,000. CD 11/22/44.

Mo., Clinton—City, defeated $610,000 bonds Nov. 17, sewerage sys. imprvs. J. W. Shickles & Co., Reliance Bldg., Kansas City, Mo., consult. engrs. CD 10/21.

▲ **Mo., Overland**—City, Tom Jordan, mayor, City Hall, 9119 Lackland Rd., Zone 14, cancelled $1,744,000 bond election Nov. 3, storm sewers. CD 10/5.

▲ **S. C., Greenville**—City, City Hall, sanitary sewer imprvs. $1,250,000. J. E. Sirrine Co., 215 S. Main St., consult. engr. CD 7/20.

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Va., Alexandria—Alexandria Sanitation Auth., 113 N. St. Asph St., incinerator, $800,000, Greely & Hansen, 220 S. State St., Chicago 4, Ill., consult. engrs. CD 1/18/51.
Ont., Sault Ste. Marie—City, ratepayers approved by-law for overall sewerage system to connect sewer mains of City and Twps. of Korah and Torentorus. $608,000.

BRIDGES

▲ O., Zanesille—City, reconstr. Fifth St. Bridge, Monroe St. Bridge, Sixth St. Bridge, all crossing Muskingum River $1,400,000.
▲ UTAH—State Road Comn., 442 State Capitol, Salt Lake City,
Box Elder Co.—26 ft. concrete bridge, 0.1 mi. Blue Creek Bridge near Promontory, F.A. Rte. 17, St. Rte. 83, $25,000.
Davis Co.—widen to 50 ft. and plant mix bit. surf. 3 mi. Becks Overpass-Parkin Underpass, U.S. 91, $175,000.
Grand Co.—plant mix surf. and steel and concrete bridge, 3 mi. Colorado River Bridge and approaches, $1,100,000.
Salt Lake Co.—concrete bridge 25 ft. span, South Jordan Canal Bridge-Redwood Rd., State Rte. 68, $18,000.
Weber Co.—plant mix bit. surf. and concrete, steel bridge 2 mi. Ogden River Bridge and resurf. Wall Ave., $300,000. E. G. Johnson, c/o owner, ch. engr. 12/31/53.

STREETS AND ROADS

▲ UTAH—State Road Comn., 442 State Capitol, Salt Lake City,
Beaver Co.—road mix bit. surf. 13.6 mi. Frisco-Wah Wah Mountains, F.A. Rte. 352, St. Rte. 21, $70,000.
Box Elder Co.—new alignment and grade, plant mix bit. surf. 4.6 mi. Tremonton-Westerly on U.S. 30, $350,000.
Cache Co.—road mix bit. surf. 3.3 mi. County Webster Jct. on U.S. 91 to Rd. Jct. near Idaho L.F.A. Rte. 47, $120,000.
plant mix bit. surf. 6 mi. Logan-Smithfield, $150,000.
Daggett Co.—road mix surf. 1 mi. Manila toward Utah State Line, F.A. Rte. 192, St. Rte. 44, $30,000.
Davis Co.—road mix bit. surf. 4.3 mi. County Cudahy Lane-5th South, Bountiful, $200,000.
Duchesne Co.—road mix bit. surf. 8.1 mi. Duchesne-Tabiona Junction, F.A. Rte. 251, St. Rte. 35, $240,000.
road mix surf. 9.4 mi. Fruitland-Tabiona, F.A. Rte. 256, St. Rte. 208, $50,000.
Emery Co.—bit. surf. 6.2 mi. Ferron-North on U-10, $325,000.
Garfield Co.—road mix surf. 6.3 mi. Escalante-Potato Wash. F.A. Rte. 392, St. Rte. 54, $185,000.
road mix surf. 3.2 mi. Orton-Paragonah, F.A. Rte. 386, St. Rte. 20, $95,000.
Iron Co.—road mix bit. surf. 17.3 mi. Paragonah-Orton, $120,000.
Juab Co.—road mix bit. surf. 2 mi. Tintic Junction-Silver City, St. Rte. 36, $60,000.
bit. surf. 3.1 mi. Eureka Revision, $100,000.
Millard Co.—road mix bit. surf. 12.9 mi. Leamington-Oak City, 1-32 ft. bridge, $310,000.
road mix bit. surf. 1.4 mi. Lynndyl Revision, $50,000.
Morgan Co.—road mix bit. surf. 2.8 mi. County Porterville-East Canyon, 1 bridge, F.A. Rte. 93, $80,000.
Salt Lake Co.—road mix bit. surf. County 39th South St., $50,000.
wid'n. and bit. resurf. 1.8 mi. 9th East, 33 South to 45 South, F.A. Rte. 140, St. Rte. 71, $100,000.
wid'n. and bit. resurf. 1.1 mi. U.S. Hy. 91-Draper, F.A. Rte. 140, St. Rte. 111, $50,000.
plant mix bit. surf. 1 mi. 23rd East, Salt Lake City, $50,000.
wid'n. to 4-lane and resurf., 5 bridges, 10.2 mi. Salt Lake Airport-Saltair Junction, $1,000,000. 6-lane on State St., 4-lane on 21st South, plant mix bit. 1.8 mi. State St., 21 St. to 34th So., and 21 St. So., State to Main Sts., $550,000.
San Juan Co.—resurf., plant mix bit. surf., cement stabilization 9 mi. Monticello-Colorado State Line on U.S. 160, $400,000.
Sevier Co.—bit. surf. 3.8 mi. Salina Canyon, $275,000. engineering and right of way 2.5 mi. Richfield North Approach, $50,000.
Uintah Co.—road mix bit. surf. 4.4 mi. LaPoint-Tridell, F.A. Rte. 260, St. Rte. 246, $154,000.
plant mix bit. surf. 5 mi. Colorado State Line-West on U.S. 40, $400,000.
Utah Co.—road mix bit. surf. 8.3 mi. Colton-Scofield, F.A. Rte. 215, St. Rte. 96, $300,000.
widen to 4-lane and resurf. 4.4 mi. American Fork-Lehi, $300,000.
wid'n and resurf. 4 mi. Provo-Olmstead, $100,000.
plant mix bit. surf. 1.9 mi. Tucker-Gilluly, $133,000.
plant mix bit. surf. 3.8 mi. Detour-Mill Fork, $94,000.
concrete and steel structures, plant mix bit. surf. 3.3 mi. Tucker-Detour, plus overpass, $650,000.
Wasatch Co.—plant mix bit. surf. 3 mi. Summit County Line-Keetley, $350,000.
Washington Co.—plant mix bit. surf. 8.3 mi. Washington-Harrisburg, $700,000.
Wayne Co.—road mix bit. surf. 6 mi. Torrey-Fruita, 12 Project-2 bridges, St. Rte. 24, $260,000. E. G. Johnson, c/o owner, ch. engr. CD 5/10/44.

EARTHWORK, WATERWAYS

▲ Ontario—Hydro-Electric Power Comn. of Ontario, 620 University Ave., Toronto, remedial works Niagara River above Horseshoe Falls (1) Grass Island Pool control weir 530 ft. long (2) channel exca. 89,000 cu. yd. (3) fickfill, $16,000,000. CD 9/50/50.

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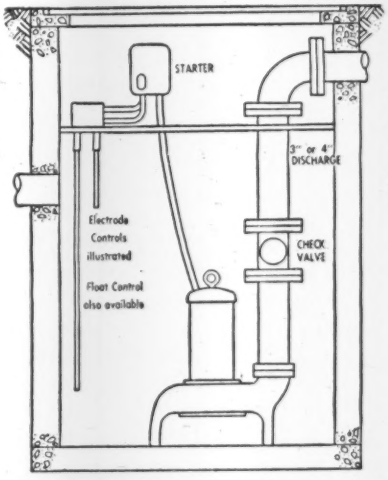

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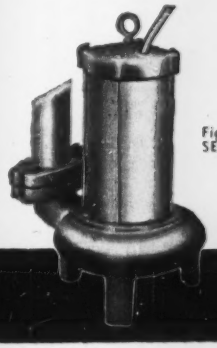

Fig. SE 860

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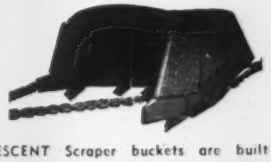

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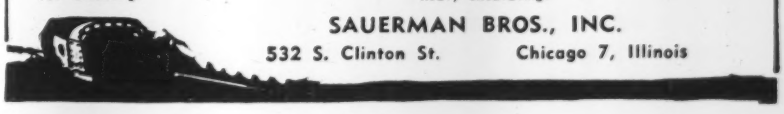

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AIRPORTS

▲† O., Springfield—AIR NATL. GUARD FACILITIES—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., Air National Guard Facilities at Municipal Airport, incl. hangar, supply and armament storage, paint, oil and dope storage; motor service shop; crash truck station; motor pool park; aircraft parking apron; 1,500 ft. runway extens.; taxiways, fencing and aircraft fuel storage facilities. $1,800,000. Peterson, Hoffman & Assoc., Spitzer Bldg., Toledo, engrs. CD 7/28.

PUBLIC BUILDINGS

Calif., Santa Ana—COUNTY WELFARE—Orange Co., Court House, plans by Wildman & Faulkner, Spurgeon Bldg., 3 story county welfare bldg. $900,000.

Conn., Southbury—BOY PATIENTS—State, Ralph G. Macy, P. Wks. Comr., State Office Bldg., Hartford, plans by Caproni Assoc., 1221 Chapel St., New Haven, 1 story, brick, steel, concrete 20,000 sq. ft., boy patients bldg., Training School. $800,000. CD 1/16/52.

▲ Ind., Indianapolis—OFFICE—State Office Building Comn., State Office Bldg., State House, preliminary studies by Raymond Kastendieck, 673 Broadway, Gary, 600,000 sq. ft. state office bldg. to house 49 state departments, parking, cafeteria, etc. $15,000,000. CD 7/27.

▲ Ind., New Albany—SCHOOL—Floyd County Bd. Educ., New Albany, plans by Hawkins & Walker, New Albany, Junior High School, $1,250,000.

▲ Ia., Muscatine—SCHOOLS—Bd. Educ., Muscatine, voted $1,100,000 bonds, school improvement program. CD 11/11.

▲† Md., Baltimore—OFFICE—General Service Admin., Public Bldgs. Service, 19 St. and F Sts. N.W., Wash., D. C., plans by Fisher, Williams, Nes & Campbell, and Buckler, Fenhagen, Meyers & Ayers, consult. archts., Federal Land Bank Bldg., Zone 18, 900,000 sq. ft., masonry bureau of Old Age & Survivors Insurance Office, $27,000,000.

▲ Mass., Lowell—SCHOOL—City, City Hall, plans by M. A. Dyer Co., 24 School St., Boston, 2 story, brick, steel, concrete Morey Junior High School, Highlands Area, Fleming St. and Van Greenby Rd. $1,000,000, Thomas Murphy, 51 Cornhill St., Boston, struct. engr. Wm. H. Kropohl & Assoc., 51 Cornhill St., Boston, elec. engrs. Chas. L. Thompson, 135 Clarendon St., Boston, plumbing engr. CD 6/5.

Mass., Wilmington—SCHOOL—Town, High School Bldg. Comn., Fred T. Corum, chn., Supt. Schools Office, plans by Sturgis Assoc., Inc., 120 Boylston St., Boston, high school addn. $800,000. CD 6/9/49.

▲ Minn., St. Paul—HIGHWAY DPT.—State, Dpt. Administration, State Capitol, plans by Ellerbe & Co., E. 505 First National Bank Bldg., bldg. to house State Hy. Dpt., on triangular tract on Capitol Approach site bounded by Rice St., Fuller Ave. and capitol mall, $2,500,000.

▲ Minn., South St. Paul—SCHOOL—City, J. F. O'Donnell, clk., voted $825,000 bonds, city hall, Bergstedt & Hirsch, 695 Endicott Bldg. on Robert St., archts. CD 11/4.

▲ Mo., Kirkwood (St. Louis 22 P.O.)—SCHOOL—Kirkwood School Dist. R-7, Bd. Educ., Floyd W. Hendricks, supt. Schools, voted $825,000 bonds Dec. 8, high school of campus type on 41 acre tract on Essex Ave., Dougherty Ferry Rd. and Chopin Dr., $1,865,000; Westchester School addn., $60,000; addnl. playground space at Turner and Des Peres Schools, $150,000, Wm. B. Ittner, Inc., 409 Bd. Educ. Bldg., 911 Locust St., St. Louis, Zone 1, engr.-archt. CD 11/23.

▲ N. J., Passaic—SCHOOL—Bd. Educ., Columbia Ave. and Van Buren St., plans by Kelly & Gruzen, 80 Fifth Ave., New York 3, N. Y., Senior High School on 4-acre tract at Poulson and Passaic Aves. $2,500,000. CD 11/5.

▲ N. Y., Roslyn—HIGH SCHOOL—Bd. Educ., Roslyn, high school on 31-acre tract, Glen Cove Rd., south of Northern Blvd. $3,000,000. CD 7/9/47.

▲ O., Toledo—HIGH SCHOOL, etc.—Bd. Educ., Adams Twp., Reynolds Rd., $2,200,000 bond election May 4, high school, $1,477,000; elementary school, $400,000, addns. to other schools, McLaughlin & Keil, Lima, archts. CD 1/22/52.

O., Youngstown—HIGH SCHOOL—Bd. Educ., 20 W. Wood St., plans by Myron N. Godwin, Union Natl. Bank Bldg., North High School, facing Mariner Ave. $900,000. CD 5/15/47.

▲ Pa., Fallsington—SCHOOL—Pennsbury Joint School Dist., Fallsington, plans by A. E. Micklewright, 72 Ewing St., Trenton, N. J., elementary school, Falls Twp. $1,000,000.

▲ Pa., Fallsington—SCHOOL—Pennsbury Joint School Dist., Fallsington, plans by A. E. Micklewright, 72 Ewing St., Wm. Penn Junior High School, $2,400,000, Pennell & Wiltberger, 1201 Chestnut St., Trenton, N. J., consult. engrs. CD 8/20.

▲ Pa., Phila.—HOUSING—Phila. Housing Auth., 42 S. 15 St., Oxford Village No. 2 Housing Development, Howell and Algon Sts. $1,000,000. CD 9/12/49.

▲ Pa., Slippery Rock—HIGH SCHOOL—Slippery Rock Area Joint School Dist., Slippery Rock, plans by W. G. Eckles, 719 Lawrence Saving & Trust Bldg., New Castle, Junior-Senior High School, $2,250,000.

▲ Pa., Wayne—SCHOOL—Radnor Twp. School Dist., plans by Barney & Banwell, Girard Trust Bldg., Phila., high school, Radnor. $1,000,000.

▲ S. C., Clemson—FOOD INDUSTRIES BLDG.—Clemson College, Clemson, plans by Hopkins, Baker & Gill, Florence, food industries bldg. $2,000,000.

▲ Tenn., Knoxville—RECEIVING-TREATMENT BLDG.—State Mental Health Dpt., Capitol, Nashville, plans by Bowman & Bowman, 613½ Market St., receiving and treatment bldg., Eastern State Hospital. $1,000,000.

▲ Tenn., Sevierville—PLANT—City, City Hall, bond election Jan. 7, plant for Cherokee Textile Co., Knoxville, $2,000,000. CD 12/19/52

Tex., Bryan—COURT HOUSE, etc.—Brazos Co., Court House, voted bonds Dec. 5, court house and jail, $800,000. Caudill, Rowlett, Scott & Assoc., Bryan, archts. CD 11/13.

▲ Tex., Dallas—HIGH SCHOOL—Dallas Independent School Dist., 2700 Ross St., plans by Goodwin & Cavitt, 4801 Lemmon St., Thomas Jefferson High School, Walnut Hill Lane, $1,500,000.

▲ Tex., Houston—ENGINEERING, etc.—University of Houston, 705 Fannin St., engineering drawing laboratory addn., $500,000; science bldg. addn., $590,000; psychology bldg. addn., $685,000; heating and power plant expansion, $175,000. CD 4/22.

▲ Tex., Orange—HOSPITAL—Orange Co., Orange, plans by Goleman & Rolfe, 5100 Travis St., Houston, 200-bed county hospital, $2,500,000. CD 12/31/52.

▲ Alaska, Juneau—SCHOOL, etc.—School Dist., Juneau, voted bonds Dec. 8, high school and community center, $4,000,000. L. Forrest, Juneau, archt. CD 11/23.

▲ Ont., Fort William—HOME—City of Fort William and municipalities of Oliver, Neebing, Paispoonge & Commie, 175-bed home for the aged in Thunder Bay District, $1,000,000.

▲ Ont., Newmarket—HOME FOR AGED—Metropolitan Council of Toronto, Housing & Welfare Comm., City Hall, Toronto, plans by Howard Chapman, 61 Avenue Rd., Toronto, 3 story, on terrain, largest home for the aged on continent, 525 bed and ambulatory aged patients. $2,500,000. CD 7/9/52.

▲ Ont., Ottawa—NATIONAL LIBRARY—Dpt. P. Wks., Hunter Bldg., plans by Mathers & Haldenby, 15 St. Mary St., national library, Wellington St. near Lyon St. for Dpt. External Affairs. $5,000,000.

COMMERCIAL BUILDINGS

▲ Calif., Huntington Beach—SHOPPING CENTER, etc.—Watkins & Associates, 810 Coast Hy., Newport Beach, shopping center, motel, restaurant, Highway 39 and Coast Hy., $2,600,000. E. Zepelin-Springe, 1133 Coast Blvd., Laguna Beach, consult. engrs.

▲ Ind., Fort Wayne—SHOPPING CENTER, etc.—Lou Hall c/o Mettler Insurance Agency, 231 E. Berry St., plans by J. G. Jackson Assocs., Kirkwood, Mo., part 2 story, 200x700 ft., Coliseum Shopping Center, parking for 1,200 cars; 15 story, 200-room first 2 stories 160x280 ft., and 13 story tower in center Coliseum Hotel and outdoor pool, 6-acre tract west of Memorial Coliseum, $4,200,000. CD 9/16.

▲ Ia., Des Moines—Y.M.C.A.—Young Men's Christian Assn., 9 and High Sts., Y.M.C.A. building. $2,500,000.

▲ Mass., Belmont—OFFICE—American Mutual Liability Insurance Co., 142 Berkley St., Boston, office, landscaping, etc., Arlmont Country Club, Concord Turnpike. $5,000,000.

N. Y., Brooklyn—APARTMENT—Hubbard Properties, Inc., 26 Court St., Zone 2, plans by Max E. Ungarleider, 66 Court St., Zone 2, 6 story apartment, 4116-24 Avenue K. $850,000.

▲ N. J., Morristown—HOSPITAL—All Souls Hospital, 95 Mt. Kemble Ave., hospital, Mt. Kemble Ave. $2,000,000.

▲ N. Y., Elmhurst—APARTMENT—W.I.C. Co., c/o Emil Proskauer & Prober, archts., 683 Pearl St., Brooklyn, Zone 1, four 6 story apartments, 80 St. and 45 Ave. $1,408,000.

▲ N. Y., New York—APARTMENT—Riverdale Realty, Inc., 12 E. 48 St., Zone 17, plans by Philip Birnbaum, 12 E. 48 St., Zone 17, 12 story apartment, 247 St. between Arlington Ave. and Henry Hudson Parkway. $2,450,000.

▲ O., Cleveland Heights—MEDICAL CENTER—Owner c/o Bascom Little, archt., 2630 Chester Ave., Cleveland, Zone 14, 3 story, approx. 50,000 sq. ft. masonry, concrete medical center, Cedar and Murray Hill Rds. $1,000,000. J. Gordon Turnbull, Inc., 2630 Chester Ave., Cleveland, Zone 14, consult. engr.

▲ O., Columbus—PRODUCE MARKET—Foster Mills, 184 S. Lazelle St., plans by Kellum & Foley, 1857 Northwest Blvd., six-building Columbus Produce Market, incl. loading docks, service station, sales booths and two 120x750 ft. concrete frame bldgs. each housing 30 stores, Nelson Rd. and Maryland Ave. $1,500,000.

▲ O., Painesville—DORMITORY—Muskingum College, Painesville, women's dormitory. $3,300,000.

Pa., Merion (Phila. P. O.)—HIGH SCHOOL—Mater Misericordiae Academy, Merion, plans by Henry A. Dagit & Sons, 1329 Race St., Phila., high school. $800,000.

▲ Pa., Villanova—COLLEGE BLDGS., etc.—Villanova University, Villanova, plans 20-year program, incl. 8 college bldgs., chapel and football stadium, $21,150,000. CD 11/26/52, under Unclassified.

▲ Tex., Galveston—MEDICAL-HOTEL-COMMERCIAL—Irwin C. Spasser, c/o Sealy & Smith Foundation, 6 and Mechanic Sts., 10 story, bsmnt., medical-hotel-commercial bldg., 6th and Mechanic Sts. area. $1,500,000.

▲ Tex., Laredo—HOSPITAL—Sisters of Mercy, Mercy Hospital, Laredo, plans by Wade-Gibson-Martin,

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419 Med. Prof. Bldg., Corpus Christi, 6 story bsmnt., 150-bed hospital, Logan, Hendricks, Garfield and Galveston Sts. $2,000,000. CD 4/13/50.

Va., Arlington—APARTMENT—M. T. Broyhill & Sons, 4624 Lee Hy., plans by Corning & Moore, 1726 "M" St. N.W., Wash., D. C., 1,000 two story bsmnt., masonry apartment units.

▲ Va., Arlington — APARTMENT — Shell Constr. Co., 1429 Nash St., plans by J. P. Fitzsimmons, 1731 New Hampshire Ave. N.W., Wash., D. C., 7 story 208-apartment units and five stores. $2,000,000.

▲ Ont., Toronto—APARTMENT BLOCKS—Orfus Constr., 65 Viewmount Ave., plans by Wilfred Shulman, 467 Spadina Ave., five 3 story, bsmnt., 61x158 ft., brick, concrete block apartment blocks, Vinci Cres., Arthur Ave. and Wilkie Rd. $1,000,000.

INDUSTRIAL BUILDINGS

▲ Conn., Naugatuck—WAREHOUSE—U.S. Rubber Co., Footwear Div., 58 Maple St., rein.-con., 200,000 sq. ft. warehouse, Rubber Ave. $4,000,000.

▲ Md., Baltimore—WAREHOUSE, etc.—Standard Oil Co. of N. J., 15 W. 51 St., New York, N. Y., warehouse, district office bldg., loading rack, garage, parking facilities, utilities, 20 storage tanks, $3,000,000, C. M. Crowell, Standard Oil Bldg., constr. and maint. engr.

▲ Pa., Phila.—PLANT—Kraft Foods Co., 500 N. Peshtigo St., Chicago, Ill., plans by Howard C. Tansager, c/o owner, 1 story, brick, 80,000 sq. ft. plant, incl. office and factory bldgs., Roosevelt Blvd. and Welsh Rd. $1,000,000.

▲ Tex., Garwood—STRIPPING PLANT—Ohio Oil Co., City Natl. Bank Bldg., Houston, stripping plant. $2,250,000.

▲ Tex., Pasadena—PLANT, etc.—Phillips Chemical Co., c/o Phillips Petroleum Co., City Natl. Bank Bldg., Houston, Tex., ethylene plant, $9,500,000; warehousing or products storage, $500,000, near here.

▲ Man., St. Boniface—PLANT—North Star Oil Co. Ltd., Scott Bldg., Winnipeg, catalytic crack plant, Dawson Rd. $5,000,000. Universal Oil Products Co., 810 S. Michigan Ave., Chicago, Ill., U.S.A., engrs. CD 1/27.

▲ Ont., Toronto—INDUSTRIAL DEVELOPMENT—Wingold Construction Co. Ltd., 2550 Eglinton Ave. W., industrial development, 1 story, brick, steel factories for sale and lease, on 30-acre site, Dufferin St. north of Eglinton Ave. W. $5,000,000.

UNCLASSIFIED

Georgia—RURAL DISTRIBUTION LINES—Irwin County Electric Membership Corp., Ocilla, 246 mi. rural distr. lines and sys. imprvs., Irwin Co. $630,000.

▲ Md., Baltimore—CLUB HOUSE, etc.—Maryland Jockey Club, 5201 Park Heights Ave., plans by Arnold W. Cigahn, 1279 Summit Ave., Lakewood, O., modernization club house, grandstands, stables. $2,500,000.

▲ Mich., Detroit—STREET LIGHTING—City, Arthur M. Lorenz, supt. P. Lighting Comm., 174 E. Atwater St., street lighting long range planning to imprv. and exten. residential and commercial sections and modernize entire sys. $1,000,000 sought in 54-55 budget. Total est. $15,000,000. George R. Thompson, Guardian Bldg., engr. CD 3/30/43.

▲ Minnesota—TELEPHONE LINES—Garden Valley Telephone Co., Erskine, 834 mi. rural telephone line in Clearwater, Mahnomen, Marshall, Pennington, Polk and Red Lake Counties, $1,935,000. CD 3/21/51.

Oregon—RURAL DISTRIBUTION LINES—Douglas Electric Co-operative, Roseburg, 110 mi. electric distr. line and sys. imprvs., Douglas Co. $445,000. CD 6/24/48.

▲ Texas-Louisiana and Arkansas—GAS LINES—Arkansas-Louisiana Gas Co., Slattery Bldg., Shreveport, La., laying 107 mi. natural gas lines on owners existing transmission sys. in Tex., La. and Ark. nine different sects. of line units to be layed with pipe from 1½ to 24 mi. in length, pipe size 8⅝ to 24 in., $7,995,166; 10,500 h.p. compressor station, near Carthage, Tex., $1,250,000.

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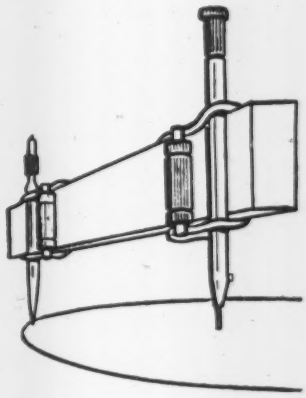

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 19 Massachusetts

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Farina Bros. Co., 429 Watertown St., Newton, Mass. CA $3,168,518, est. $2,970,000. Contr. 1, railroad grade crossing elimination Lincoln Square, Worcester. CD 12/8, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
J. F. White Constr. Co., 201 Alewife Brook Parkway, Cambridge, Mass. CA $3,822,419, est. $3,000,000. Hy. and bridge Amvets Memorial Hy., F.A. Proj. F 344 (3), Brockton and West Bridgewater;
S. Rotundi & Sons, 2 Washington St., Melrose, Mass. CA $2,637,832, est. $2,500,000. Hy. and bridge constr., relocation Rte. No. 3, Billerica and Chelmsford. CD 12/7, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

▲ **N. Y., West Point**—B.A. 6/25—U. S. Eng., 80 Lafayette St., New York, Zone 13, sewage disposal plant, $1,000,000-$3,000,000. Alexander Potter, 50 Church St., New York, Zone 7, archt.

BIDS ASKED—BUILDINGS

▲ **Md., Towson**—OFFICE—B.A. About 3/4—Dpt. P. Wks., Baltimore Co., Zone 4, 3 story, 209x143 ft., county office. $2,000,000. William F. Stone, 2612 N. Charles St., Baltimore, archt. Paul J. Grubb, co. archt. CD 2/24.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Dan-Bar Contg. Co., Inc., 220 Pulawski St., Syracuse, N. Y., LB $212,063, est. $227,000, 0.35 mi. Adams St., Arterial Rte., City of Syracuse, Onondaga Co.;
A. E. Ottaviano, Inc., 82 Brook St., Croton-on-Hudson, N. Y., LB $6,645,331, est. $7,620,000, 10.29 mi. Suffern-Nyack Sect. New York State Thruway, Rockland Co.;
Yonkers Contg. Co., Inc., 969 Midland Ave., Yonkers, N. Y., LB $3,835,030, est. $4,000,000. 3.21 mi. in City of Yonkers, So. Westchester Connection, New York State Thruway, Westchester Co.;
A. Piotzker Co., Inc., 79 Woodstock Rd., Rochester, N. Y. LB $738,428, est. $825,000, grade crossing elimination at Washington St., in East Rochester, Monroe Co. Bids Dec. 18. CD 11/25.

▲ **Leo Butler Co.**, 9217 51 Ave., College Park, Md., LB, $1,440,646, Sect. 3, East Branch, Piny Branch Trunk Sewer, Kansas Ave. from Randolph St. to Varnum St. N.W., WASH., D. C. D. C. Govt. 499 Pennsylvania Ave. N.W., Wash., D. C. Bids Dec. 17. CD 11/30.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 2, N. Y., LB $4,269,000, East Queens HIGH SCHOOL, Hillside and Seward Aves. between 229 and 232 Sts., Queens Boro, BELLEROSE, N. Y. Dir. Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 2, N. Y. Bids Dec. 8. CD 11/10.

▲ **T. G. K. Constr. Co., Inc.**, 55 W. 42 St., New York 18, N. Y., LB $1,859,500, Junior HIGH SCHOOL 104, E. 21 St., between 1st and 2nd Aves., Manhattan Boro, E-221, NEW YORK, N. Y. Dir. Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Voorhees, Walker, Foley & Smith, 101 Park Ave., New York 17, N. Y., archts. Bids Dec. 11. CD 11/16.

▲ **Boulevard Homes, Inc.**, 1430 Spruce St., Phila., Pa. Separate Contracts. $2,000,000. 250 row type RESIDENCES, Guyer Ave., PHILA., PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

▲ **Joseph R. Farrell, Inc.**, 4424 Market St., Phila., Pa., CA $2,000,000. Father Judge Boys HIGH SCHOOL, PHILA., PA. Roman Catholic Archdiocese of Phila., 19th and Wood Sts., Phila., Pa. Stickle & Assocs., 2422 Prospect Ave., Cleveland, O. archts. CD 12/1.

▲ **Baltimore Contractors, Inc.**, 711 S. Central Ave., Baltimore, Md. CA $2,258,300. general contract brick DORMITORIES, 2 men's units, 1 women's unit, COLLEGE PARK, MD. University of Maryland, College Park, Md. CD 12/1, under LB.

SOUTH

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Fowler-Jones Constr. Co.**, Reynolds Bldg., Winston-Salem, N. C., CA. Approx. $1,250,000, four men's DORMITORIES on new campus, WINSTON SALEM, N. C. Wake Forest College, Wake Forest, N. C. CD 8/7/46.

▲ **Kelly Constr. Co.**, P.O. Box 1521, Shreveport, La. LB $1,243,457, high SCHOOL, BASTROP, LA. Morehouse Parish School Bd., Bastrop, La. Bids Dec. 15. CD 11/17.

MIDDLE WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus,
Lombardo Bros. Constr. Co., 3600 Ridge Rd., Cleveland, O. LB $4,808,624, Sect. 22, 4.5 mi. Ohio Turnpike, Lorain and Cuyahoga Counties;
S. J. Groves & Sons Co., Elyria, O., LB $6,334,328, Sects. 60, 61, 62, 12.9 mi. Ohio Turnpike, Williams Co. Bids Dec. 18. CD 11/18.

▲ **MICHIGAN**—State Hy. Dept., Charles M. Ziegler, comr., Lansing,
S. J. Groves & Sons Co., Wesley Temple Bldg., Minneapolis, Minn. CA $2,762,607, est. $3,600,000. grading, sub-base constr. 13.3 mi. Detroit-Toledo Expressway, BM 58-37 C2 R, Wayne and Monroe Counties;
Loselle Constr. Co., 1555 Goddard St., Wyandotte, Mich. CA $692,579, est. $700,000. grading, paving, capping, SS 77-61 C1-R, SS 77-61 C2-U, (S 332 3), St. Clair Co. Bids Dec. 16. CD 12/8 and 12/1.

▲ **Bryant & Detwiler Co.**, 2304 Penobscot Bldg., Detroit, Mich. LB $1,930,600. Contr. NE-7 chemical bldg., misc. structures, Northeast Station, DETROIT, MICH. City, Bd. Water Comrs., Water Bd. Bldg., 735 Randolph St., Detroit, Mich. Bids Dec. 15. CD 11/16.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Herlihy Mid Continent Co.**, 135 S. La Salle St., Chicago 3, Ill., LB, $1,682,920, PARKING GARAGE Wacker Dr. at Madison St., CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Dec. 11. CD 11/25.

▲ **Jas. McHugh Constr. Co.**, 6449 S. Parkway, Chicago, Ill., CA, $6,200,500, general contract, COUNTY GENERAL HOSPITAL addn., WAUWATOSA, WIS. Milwaukee County Institutions & Grounds, 8731 Watertown Plank Rd., Wauwatosa, Wis. Bids Dec. 3. CD 12/10, under LB.

▲ **J. A. Utley Co.**, 723 E. 10 Mile Rd., Ferndale, Mich., and **Darin & Armstrong, Inc.**, 2041 Fenkel St., Detroit, Mich. CA Est. $6,000,000. 1 story, masonry, steel stamping and frame PLANT, FLINT, MICH. Chevrolet Motor Div., General Motors Corp., 3044 West Grand Blvd., Detroit, Mich. CD 9/14.

▲ **Rossin & Ringer**, 18685 Wyoming St., Detroit, Mich. Owner Builds. $2,100,000. 250 single HOMES, Manhattan, 12 Mile Rd. and Harper, ROYAL OAK, MICH.

▲ **Hall Engineering Co.**, 888 West Baltimore St., Detroit, Mich. CA $6,000,000. electrical contract incl. sys. of incoming power lines, 24,000 volts to tandem finishing mill installation and two 200 ton electric arch furnaces for steel PLANT, TRENTON, MICH. McLouth Steel Corp., 300 South Livernois St., Detroit, Mich. CD 12/7, under CA.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
January 26 Montana
STREETS AND ROADS
January 26 Montana

▲† **Texas**—B.A. 1/7—U. S. Eng., foot of Prytania St., New Orleans, La. relocation of St. Louis Southwestern Ry. embankment, constr. between Texarkana and Naples, generally paralleling Hy. 67, work divided into 6 items, bid on one, all or any combination, Bowie and Cass Counties, Inv. 54-112. $2,000,000-$4,500,000.

BIDS ASKED—BUILDINGS

▲ **Kan., Wichita**—SCHOOL—B.A. 2/1—Bd. Educ., I. W. Mayberry Intermediate School, $1,300,000, Hibbs, Robinson & Pettit, 519 S. Broadway, archts. CD 10/19.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Charles F. Smith & Sons**, 118 Spirea Dr., Dayton, O. CA $2,960,768, water transmission line from Ashland pumping station to 51st St. pumping station, LINCOLN, NEB. City, City Hall, Lincoln, Neb. Bids Dec. 10. CD 1215, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Gambel Constr. Co.**, 804 Pine St., St. Louis 1, Mo. CA $2,587,000. general contract;
S. C. Sachs Co., Inc., 6540 West Park Ave., St. Louis 10, Mo. CA $627,500. electrical contract for 4 story, brick TECHNICAL HIGH SCHOOL, 5101 Northrup Ave., ST. LOUIS, MO. Bd. Educ., V. Harry Rhodes, comr., School bldgs., Bd. Educ. Bldg., 911 Locust St., St. Louis 1, Mo. CD 12/8, under LB.

▲ **American Constr. Co.**, Box 13,087, Houston, Tex., CA $2,334,900. SENIOR HIGH SCHOOL, in Bellaire area, HOUSTON, TEX. Houston Independent School Dist., 1600 Washington St., Houston, Tex. Bids Dec. 10, awarded Dec. 17. CD 12/16, under LB.

FAR WEST

BIDS ASKED—BUILDINGS

▲ **Calif., Los Angeles**—HOUSING—B.A. 1/26—Housing Auth. of City of Los Angeles, 1401 East First St., Part 2, 140 dwelling unit increment, Pueblo Del Rio Extension, Cal. 4-15, 53 St., 55 St. and Long Beach Ave. Plans deposit $100. Extended date. CD 11/18.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ † **Willamette Iron & Steel Co.**, 2860 N. W. Front St., Portland, Ore., CA $1,860,972, intake structures and gate structures, The Dalles Dam, Wasco Co., CIVENG-35-026-54-5, OREGON, U. S. Eng., Pittock Block, Portland, Ore. Bids Nov. 19, awarded Dec. 13. CD 11/25 under LB.

▲ **OREGON**—State Hy. Comn., Highway Bldg., Salem,
Newport Constr. Co., 7031 N.E. Halsey St., Portland, Ore., CA $257,075, grading, oiling 5.8 mi. Baker-Homestead Hy. FAP S-11 (4), Baker Co.;
Warren Northwest, Inc., 9860 N.E. Hancock Dr., Portland, Ore., CA $168,644, grade 0.88 mi. roadbed, pave 7.52 mi. North Santiam Hy. FAP S-220 (6), Marion Co.; CA $432,189, grade, wid'n., paving 20.5 mi. Central Oregon Hy. FAP F 147 (11) and BFI-148 (15), Deschutes Co.;
L. P. Stubblefield, Eugene, Ore., CA $205,420, roadbed wid'n., paving 6 mi. Territorial Hy., FAP S-247 (4), Lane Co.;
Berke Bros. & C. R. O'Neil, 7923 N.E. Halsey St., Portland, Ore., CA $1,515,560, grading 15.04 mi. Old Oregon Trail Hy. FAP BFI-62 (4), Umatilla Co. Grand total $2,578,888. Bids Dec. 10. R. H. Baldock, c/o owner, engr.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
Winston Bros. Co., 1532 S. California St., Monrovia, Calif. CA, $1,958,110, 2.5 mi. roadway, 5 bridges on Santa Ana Freeway, ORANGE Co. Bids Dec. 3, awarded Dec. 16. CD 12/9, under LB.

▲ **Connolly-Pacific Constr. Co.**, 1925 Water St., Long Beach, Calif., LB, $1,769,349, Schedule B, harbor imprvs. incl. two rock jetties and raising two existing jetties, LONG BEACH, CALIF. City, City Hall, Long Beach, Calif. Bids Dec. 17. CD 12/6/44.

▲ **Metropolitan Water District of Southern California**, 306 W. 3 St., Los Angeles, Calif., rejected bids Dec. 9, pump delivery pipe lines at 5 pump stations, Colorado River Aqueduct, LOS ANGELES, CALIF. LB, $3,075,960. CD 12/15, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

CANADA
STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 6 British Columbia

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **J. Robert Page Ltd.**, 211 Davenport Rd., Toronto, Ont., CA, $2,500,000 HOUSING DEVELOPMENT for defense workers, incl. 250 houses, STREETSVILLE, ONT. E. O. Ewing, 73 King St. W., Toronto, Ont., engr. Grant A. Whatmough, 110A Crescent St., Toronto, Ont., archt. Awarded Dec. 10.

▲ **20th Century Housing Corp.**, 56 Lyon St., Ottawa, Ont., Owner Builds, $5,000,000, 40 APARTMENT BLOCKS, PONT VIAU, QUE. Ben. A. Shulman, 1421 MacKay St., Montreal, Que., archt.

▲ **George Hardy Ltd.**, 163 Wicksteed Ave., Leaside, Ont., LB, $5,230,760, NATIONAL FILM BOARD BLDG., Ville St. Laurent, MONTREAL, QUE. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Dec. 16. CD 11/4.

▲ **D'Amours & Frere Ltee**, 2633 Bourbonniere Ave., Montreal, Que., CA, $1,376,500, SCHOOL, on Champlain Blvd. "Ecole Superieure Notre-Dame Auxiliatrice, VERDUN, QUE. Verdun Catholic School Comn., 3500 Wellington St., Verdun, Que. CD 8/7.

ALASKA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ † **Reed & Martin**, Fairbanks, Alaska, LB $1,966,207, HIGH SCHOOL, Proj. 50-A-50, FAIRBANKS, ALASKA. Dpt. Interior, Alaska P. Wks., Juneau, Alaska, Bids Dec. 16. CD 11/30.

LATIN AMERICA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Constructora Venezolana Martin**, Maracaibo, Venezuela, CA Est. $2,400,000. HOSPITAL at refinery, PUNTA CARDON, VENEZUELA. Shell Oil of Venezuela, Caracas, Venezuela.

(Proposal Advertisements see pp. 56 and 57)

UNIT PRICES

Widening highway, Kentucky

The final section of the Louisville "Inner Belt Line" highway will be built for $1,298,573 by a combination of Harry O. Wyse, Lexington, Ky. & Highland Construction Co., Inc., Louisville, Ky. Among bids submitted to the Kentucky State Highway Department, the Wyse-Highland bid came in lowest of seven.

Roadwork amounts to $688,068 or 53% of the cost. This includes grading, draining and paving 2.708 miles with bituminous concrete.

Underpass construction totals $358,761 or 28%. Three box-girder underpasses will be constructed of reinforced concrete: one 89-ft long and two 79-ft long.

The remaining $251,744 or 19% will be used to build three bridges. Two will be side-by-side, each containing one 45-ft and two 25-ft deck girders. The third will be an 81-ft, I-beam span overpass and interchange.

In this area plasterers are receiving $3.00 per hr; cement finishers, $2.70 per hr; and reinforced ironworkers, $2.53 per hr. Bidders include:

1C	Harry O. Wyse, Lexington, Ky., & Highland Const. Co., Inc., Louisville, Ky.	$1,298,573
2	Foster & Creighton Co., Nashville, Tenn.	1,311,714
7	R. B. Tyler Co., Louisville, Ky.	1,477,046

Bids: 11-6-53 Items	Unit	Quantity	Unit Prices 1C	2
Clearing & grubbing	ac	158.43	$35.00	$100.00
Roadway excavation	cy	280,666	0.39	0.62
Struct exc, unclassified	cy	8,377	5.75	5.00
Struct exc, common	cy	6,540	4.00	3.75
Struct exc, solid rock	cy	1,120	15.00	12.50
Overhaul	stay	7,570	0.02	0.05
Removing pipe	lf	1,807	1.50	2.50
Removing pipe headwalls	ea	15	10.00	20.00
Removing guard rail	lf	410	1.00	0.50
Removing curb & gutter	lf	425	0.75	0.40
Removing conc pavement	sy	1,090	1.00	0.70
Removing conc masonry	cy	15	5.00	5.00
Removing conc sidewalk	sy	353	0.25	0.30
Removing catch basins	ea	10	25.00	20.00
Removing brick manhole	ea	1	100.00	50.00
Removing valley gutter	sy	230	1.35	1.00
Removing curb	lf	293	0.50	0.40
Curb & gutter box inlet 24" 15", type 2	ea	2	330.00	350.00
18", type 2	ea	21	250.00	300.00
Roll curb catch basin, 15"	ea	14	300.00	325.00
24"	ea	25	150.00	350.00
Valley gutter box inlet 24"	ea	1	200.00	300.00
18"	ea	2	200.00	150.00
Lip curb box inlet, 15"	ea	13	180.00	360.00
Median strip, 4'	lf	4	150.00	300.00
Junction box for 18" pipe	ea	3,290	3.50	1.10
Special curb	lf	2,330	3.00	3.00
Roll curb	lf	6,771	3.00	3.00
Std conc curb & gutter	lf	8,893	3.00	2.00
Special island curb	lf	1,657	2.50	1.20
Lip curb	lf	545	0.50	0.25
Adjust MH frame to grade	ea	1	50.00	40.00
Valley gutter	sy	68	5.50	5.50
Concrete sidewalk, 4"	sy	2,804	4.50	3.80
Off ramp nose	ea	4	150.00	75.00
Project monument	ea	2	35.00	30.00
Flume	lf	32	7.00	5.00
Flume inlet	ea	3	250.00	300.00
Final dressing	100'sta	92.7	35.00	30.00
Water	100gal	25,756	0.05	0.20
Roll curb catch basin partial const, 15"	ea	6	150.00	180.00
24"	ea	2	180.00	200.00
Curb & gutter box inlet, type 2, partial const, 15"	ea	1	180.00	180.00
Conc entrance pvmnt, 6"	sy	7	5.00	5.50
Manholes	ea	29	250.00	150.00
Sod	sy	6,615	0.60	1.00
Agr ground limestone	t	10.6	15.00	13.00
6-10-4 comm fertilizer	t	3.2	100.00	60.00
Seeding & protection	sy	16,950	0.11	0.35
Entrance pipe, 15"	lf	180	3.25	2.50
Structural steel	lb	360,966	0.19	0.20
Class "B" concrete	cy	22.7	60.00	100.00
Class "D" concrete	cy	41.98	200.00	120.00
Steel reinforcement	lb	1,213,166	0.12	0.12
Conc slope wall	sy	923	5.50	5.00
Bronze plates	lb	760	1.20	1.40
Aluminum hand rail	lf	506.93	32.00	32.00
Remove existing bridge	ls	1	1,500	300.00
Perf pipe, corr met, 6"	lf	1,050	1.50	2.00
Perf pipe, corr met, 8"	lf	1,050	1.50	2.00
Sewer pipe, 6"	lf	362	1.15	1.00
Cr limestone base, stab	t	5,420	2.12	2.40
Cr limestone for base & insul	t	43,490	2.95	2.92
Cr limestone for traffic bond	t	10,370	2.07	2.24
Refined tar RT-2	gal	10,655	0.22	0.22
Bit conc base, cl 1	cy	1,357	12.40	13.06
Bit conc binder, cl 1, type B	cy	2,543	12.40	13.06
Bit conc surf, cl 1, type B	cy	2,085	12.40	13.06
Asph cement PAC-5	gal	6,200	0.18	0.18
Cr limestone #9 for A-2 seal	t	35	3.50	3.00
Bit mat PAC-9, RC-2 or RS-2 for A-2 seal	gal	820	0.18	0.18
Stabilized base	sy	56,827	0.10	0.08
Culvert pipe, 15"	lf	5,691	3.75	2.50
18"	lf	4,212	4.34	3.00
24"	lf	1,576	6.12	5.00
30"	lf	886	8.90	6.00
36"	lf	276	10.85	9.00
48"	lf	1,692	18.00	15.00
Class "A" concrete	cy	6,234.6	60.00	54.00
Furn 10" stl brng piles	lf	648	3.00	3.40
Drive 10" stl brng piles	lf	648	3.00	3.40

Concrete road paving, Texas

A 1.609-mile section of the Belt Line Road, Garland, Texas, will be paved with 8-in. thick concrete by the Texas Bithulithic Co., low bidder of four on the $195,298 Texas Highway Department contract. Koch and Fowler are the engineers.

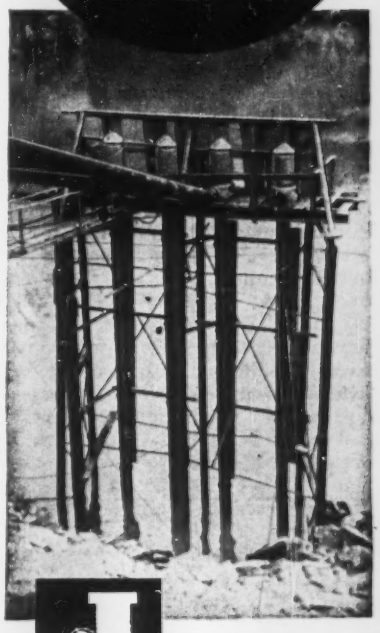
Because of the high P. I. of the sub-grade soil, a 4-in., compacted, flexible base will serve as a sub-base under the 8-in. concrete pavement to minimize the effects of differential settlement and swellage and to aid in the prevention of "pumping."

Minimum rates to be paid are skilled labor, $1.625 per hr; semi-skilled, $1.25 per hr; and common, $0.80 per hr. Bidders include:

1C	Texas Bitulithic Co., Dallas, Texas	$195,298
2	Austin Road Co., Dallas, Texas	206,599
4	L. H. Lacy Co., Dallas, Texas	227,256

Bids: 8-3-53 Item	Unit	Quantity	Unit Prices 1C	2
Clearing & grubbing	ls	1	$600.00	$650.00
Common excavation	cy	36,500	0.30	0.40
Embankment processed	cy	3,400	0.16	0.18
Salvage flexible base	sta	85	10.60	7.75
Flexible base	cy	1,350	2.40	2.33
Aggr for double asphalt surface treatment	cy	75	6.40	6.55
Asph for double asphalt surface treatment	gal	2,875	0.18	0.20
8" conc pvmnt & 4" comp flexible base	sy	40,700	3.33	3.56
Integral curb	lf	13,000	0.29	0.40
Concrete driveways	sy	475	4.05	3.50
Cl "A" conc, culverts	cy	111.58	45.00	55.00
Reinforcing steel	lb	14,849	0.12	0.11
Reinf conc pipe, 15"	lf	260	3.45	2.90
18"	lf	752	3.80	3.48
24"	lf	184	4.90	4.70
27"	lf	228	6.05	5.45
36"	lf	412	9.15	7.95
42"	lf	228	11.05	9.70
48"	lf	180	12.45	10.35
Corr galv met pipe, 22"x13"	lf	96	5.60	3.69
Rem & relay culv pipe	lf	512	6.00	2.88
Special inlet	ea	1	175.00	248.00
Inlet, 36"	ea	12	140.00	150.00
48"	ea	9	160.00	160.00
60"	ea	6	175.00	175.00
6'	ea	5	190.00	200.00
7'	ea	8	240.00	260.00
8'	ea	5	265.00	275.00
10'	ea	7	300.00	300.00
Rem old struct, small	ea	40	32.00	15.00

Critical Pumping Job is routine for JOHNSTON



JOHNSTON VERTICAL PUMPS

When the constructors of the Albeni Falls power and flood control project on the Columbia River basin needed pumps to dewater the reservoir behind a coffer dam before pouring the foundation of the powerhouse, they selected Johnston Turbine Pumps. Four units were installed to pump 7500 G.P.M. each at a head of 85 feet. These Johnstons are 24 inch pumps rated at 200 H.P.

Not only was the reservoir lowered in record time, but the pumps are continuing to handle seepage until the powerhouse is completed.

This is another example of the ability of Johnston equipment to handle all types of pumping jobs, large or small. Why not let our engineers consult with you on YOUR particular problem.

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JOHNSTON PUMP COMPANY
3272 EAST FOOTHILL BLVD.
PASADENA 8, CALIFORNIA

Fanny Mae: A headache for the White House

Housing advisory group has two different methods for getting government out of the mortgage market

A lady named Fanny Mae—who has been a major buyer of FHA and VA mortgages—is among the more important problems that President Eisenhower and his advisers have to deal with this week in shaping their 1954 program for Congress.

The President's advisory committee on housing has presented him with two different ways to deal with the Federal National Mortgage Assn.—generally known as Fanny Mae. Both agree that Fanny Mae should be, as much as possible, a privately financed agency. One approach—the majority recommendation—emphasizes the cautious attitude of the institutional lender, conditioned to protect the individuals whose savings it holds in trust. The other approach—whose spokesman is Richard G. Hughes, a vice-president of the National Association of Home Builders—emphasizes America's need for housing.

• **Split**—The majority suggestion: Junk Fanny Mae altogether and set up a privately financed corporation under supervision of the Federal Home Loan Bank Board. The minority recommendation: Retain the structure of Fanny Mae, utilizing its surplus funds and loss reserves as capital, operating under new rules and under the supervision of the Housing & Home Finance Agency. For various reasons, Hughes blasted the majority's plan as unworkable.

Fanny Mae holds a portfolio of about $2.5 billion of FHA and VA mortgages, purchased over past years to support the mortgage market. The reason it has acquired so many mortgages is this: As long as lenders could get higher interest rates on conventional home mortgages than they could from FHA and VA mortgages, they tended to sell this less desirable paper to Fanny Mae in order to free their funds for more profitable investment.

• **Fanny Mae's history**—This was not the original purpose of Fanny Mae, which was supposed to be a temporary purchaser of mortgages, thus stabilizing the mortgage market. FNMA was intended to buy mortgages in areas where mortgage money was hard to find and resell them to permanent investors when opportunity arose. It was supposed to buy mortgages in periods when the usual mortgage investors were out of the market temporarily. By its very existence FNMA was supposed to make mortgages more attractive investments, assuring banks and savings & loan associations that they could always convert some of their mortgages into cash at times when they needed cash badly.

Instead, Fanny Mae became to a large extent a long-term investor in mortgages. In this role it has done a lot to finance the postwar housing boom. But obviously Fanny Mae could not go on indefinitely buying more mortgages than it sold. For one thing, although Fanny Mae has been profitable to the government, it has been bringing the government more and more into private business. For another, its huge backlog of mortgages was becoming a potential depressing factor upon the market. Also, mortgage rates have moved higher, thus lowering the value of the 4% and 4¼% paper held by Fanny Mae.

That's why, early this year, FNMA (with some exceptions) stopped buying mortgages. Last August, it again started making commitments to take mortgages, providing that the original mortgage lender took on an equal amount of mortgages from its portfolio.

• **Flexible rate needed**—What could be done with Fanny Mae? A credit subcommittee of the advisory housing group studied the problem. They agreed that one basic policy had to be changed. Interest rates on FHA and VA mortgages would have to be in line with the rest of the mortgage market, not arbitrarily held below the market rate.

Otherwise, a publicly financed FNMA would continue to acquire more and more mortgages. If it were decided to set up a privately financed replacement for FNMA, the new facility would also have trouble, unless FHA and VA mortgage rates were flexible. A private agency would have to borrow most of its funds. In order to operate successfully there would have to be a "spread" between the cost of its borrowing and the income it took in from FHA and VA mortgages. This spread would be needed to pay operating expenses, build up loss reserves and capital funds, and pay dividends on stock. In other words, the interest cost on a private agency's debentures would have to be lower than the yield on its own investments.

Many financial observers have been skeptical that a private agency would be able to find buyers for its debentures. The question has been asked: Why would institutional investors want to buy debentures, when they can buy the mortgages themselves at a higher yield?

Still, the President's housing committee believed that some sort of privately financed agency was possible, under federal supervision. The credit subcommittee of the President's advisory group on housing agreed that one should be set up, to be known as the "National Mortgage Marketing Corporation."

• The first dilemma: What ro do about FHA and VA mortgage rates?

Thus the credit subcommittee had a Grade A dilemma to solve. On the one hand, flexible FHA and VA mortgage rates were essential to the success of a privately financed agency. On the other hand, unless mortgage rates were low they might block the housing committee's plans for private financing of urban redevelopment and rehabilitation, and the plan for 40-year mortgages on low-cost housing to be taken out by owner-occupants.

Here's how the credit subcommittee met this problem: Rates on FHA and VA mortgages were to be flexible. Although the group was unwilling to go so far as to allow rates to be set by the market itself, it proposed that a committee be empowered to change rates from time to time.

In order to be sure that rates did not climb too far above their normal relationship with the long-term government bond market, the majority recommendation provided that FHA and VA rates be no more than 2½% higher than the current average yield on all outstanding marketable U. S. bonds with a maturity of 15 years or more. This allows plenty of leeway. For instance, right now it would make the top limit for FHA and VA rates about 5.3%.

The minority recommendation, by

Hughes of the NAHB, provided for a narrower spread. He wants the top limit on government-guaranteed mortgages to be set not more than 2% above current average yield of government bonds of 10 years or more maturity. That, right now, would make the maximum about 4.68%.

• **Hughes' position**—In addition, Hughes had an answer to the flexible-rate dilemma. In order to provide market support for mortgages which finance private urban redevelopment and rehabilitation, and the 40-year mortgages on low-cost, privately owned housing, he suggested that the new facility sell debentures whose principal and interest would be guaranteed by the government. This would, he believed, provide the funds to keep these programs going until private lenders were assured that they are sound.

Hughes said emphatically that he disagreed with the general tenor of the majority plan. He felt that NMMC, set up as the majority plan outlined it, would be unable to meet the "extra burden of providing the volume of financing necessary for the urban reconditioning and rehabilitation program" and other programs suggested by the housing group.

Hughes suggested that profit should not be the only objective of NMMC. "Its only reason for being," said he, is to afford "an adequate and stabilized mortgage market so that homes may be provided in the volume, in areas, of the kinds and at the prices that the market demands." In other words, if private credit is unable to satisfy the housing needs of potential home buyers, Hughes thinks that government should lend its credit. The majority group, on the other hand, wants a private secondary mortgage facility to be able to stand on its own feet.

• The second problem: How much penalty to charge for use of NMMC?

Though the group agreed that a privately financed but semi-public National Mortgage Marketing Corp. should be set up, it proceeded to disagree about another major policy.

In order that the proposed NMMC would not be an involuntary permanent holder of mortgages, the group agreed that it should compel those lenders using its facilities to pay a penalty. The majority wanted institutions selling mortgages to NMMC to be required to own stock in NMMC equal to 4% of the unpaid balance of the sold mortgages. Here again something of a split developed. Hughes, though he recognized that NMMC should be a temporary holder of mortgages, thought that the deterrent shouldn't be so steep. He suggested 2%.

• The third split: How to provide the capital?

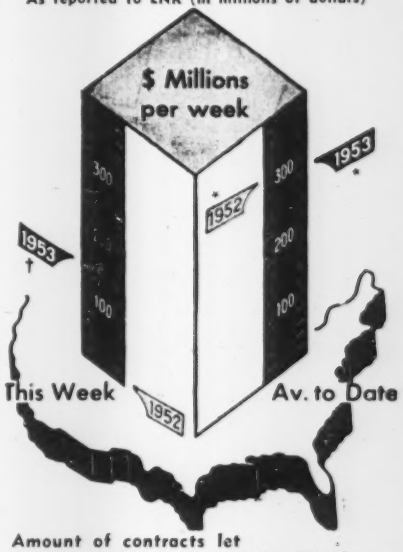
The widest basic split between Hughes and the majority recommendation was on who should control NMMC and who should provide its capital funds. The majority wanted Fanny Mae to be abolished. The majority wanted NMMC to be supervised by the same board which supervises the Federal Home Loan Banks, but as a separate corporate entity. Initial capital of $50 million could be provided by the potential customers of NMMC—financial institutions and mortgage companies with a minimum capital of $100,000. For an initial period of 90 days, these would be eligible to buy up to $50 million of stock, after which time initial capital would be made up by the Federal Home Loan Banks. These banks are owned by their members, practically all of whom are savings & loan associations. This initial stock gradually would be retired, out of the proceeds of later stock sales and out of earnings. NMMC would act as Fanny Mae's agent to sell its portfolio "in an orderly manner."

Hughes was unwilling to junk Fanny Mae completely merely because it has been used in the post World War II years to support low rates on government-guaranteed mortgages. He believed it would be a waste of time to drop the Fanny Mae organization and then set up a new semi-private facility. Why not just convert Fanny Mae into NMMC? That also would have the effect of avoiding any interruption in Fanny Mae's gradual liquidation of its huge portfolio under the one-for-one plan.

So Hughes' proposal was that Fanny Mae pay back, to the Treasury out of its surplus funds and loss reserves, the original $21-million capital originally provided. He figured that it would then have left about $40 million in undistributed surplus and in loss reserves, which would become NMMC's capital. Fanny Mae's portfolio would be taken over by NMMC, and the Treasury gradually would be repaid the funds it advanced.

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

	This Week†	Cumulative 53* wks 1953	1952	% chge‡
Federal	$11.9	$1,417.6	$1,501.1	−69
State and municipal	89.1	5,088.0	4,075.6	+22
Total pub.	101.0	6,505.6	8,576.7	−26
Total priv.	52.2	8,665.3	7,112.6	+29
U. S. total	**$153.2**	**$15,170.9**	**$15,689.3**	**−5**
Contracts by type of work				
Waterworks	$3.2	$246.8	$231.1	+5
Sewerage	7.8	431.1	304.3	+37
Bridges	7.1	752.1	413.9	+78
Highways	30.5	1,792.4	1,396.1	+26
Earthwork, waterways	3.2	374.5	495.8	−25
Buildings:				
Public, excl. hsg.	35.7	1,736.3	4,292.4	−60
Housg., pub.	2.2	375.2	606.5	−39
Housg., priv.	9.7	3,463.9	3,001.9	+13
Commercial	9.3	1,157.5	843.4	+35
Industrial	30.9	3,178.5	2,722.3	+15
Unclassified	13.6	1,662.6	1,381.6	+18
Total	**$153.2**	**$15,170.9**	**$15,689.3**	**−5**

*53 weeks in 1953; 52 weeks in 1952
†4-day week ‡average weekly volume
NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $200,000.

New capital for construction

	Week of Dec. 24 1953	Cumulative 52 Wks 1953	% chge 1952-53
Corporate securities	$26.9	$4,308.6	+20
State and municipal:			
Excluding housing	441.3	4,722.9	+51
Housing	6.9	269.7	−15
Federal loans	1.6	114.0	−67
Federal aid	...	770.9	+40
Total non-federal	**$476.7**	**$10,186.0**	**+29**
Federal approp.:			
In U. S.	...	$1,566.7	−79
Outside U. S.	...	28.9	−85
Total new capital	**$476.7**	**$11,781.7**	**−24**

ENR indexes

		Base Years = 100 1913	1926	1949
Constr. cost	Dec '53	611.48	293.94	128.19
	Nov '53	611.92	294.15	128.28
Bldg. cost	Dec '53	435.90	235.63	123.91
	Nov '53	436.34	235.87	124.03
Volume	Nov '53	354	144	102
	Oct '53	528	215	153

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.50 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4095) will be received at Billings, Montana, until February 2, 1954, for furnishing labor and materials for Missouri Diversion Dam, Missouri Diversion Unit, Missouri-Souris Division, Missouri River Basin Project. Location approximately 20 miles west of Wolf Point, Montana, in Valley and McCone Counties. Principal items are: 2,590,000 cu. yds. excavation; 1,078,000 cu. yds. dike embankment; 67,010 cu. yds. concrete; 3,585,000 lbs. furnishing and placing reinforcement bars; 97,400 barrels furnishing and handling cement; 848,800 lbs. installing radial and drum gates; and other work. Completion time 1000 days. For particulars, address Bureau of Reclamation, Billings, Montana; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4099) will be received at Loveland, Colorado, until January 21, 1954, for furnishing labor and materials for St. Vrain Supply Canal, Station 236+80 to Station 244+18.0 Ah., Colo.-Big T. Proj. Location: Near Lyons, Colorado, in Larfmer County, Principal items are: 70,000 cu. yds. excavation; 1080 sq. yds. preparing foundations for concrete canal lining; 2400 cu. yds. placing and compacting earth lining; and other work. Completion time 120 days. For particulars, address Bureau of Reclamation, Loveland, Colorado; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4100) will be received at Denver, Colorado, until January 28, 1954, for furnishing 55 vertical-shaft pumping units and 4 horizontal centrifugal-type pumping units having capacities ranging from 144 gpm to 23 cfs, and heads ranging from 11 ft. to 230 ft. for Delano-Earlimart Irrigation District, Unit 3, Central Valley Project, California. Delivery is desired within 150 to 270 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

Read the Official

Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

U. S. Government

PANAMA CANAL COMPANY, 24 STATE STREET, NEW YORK 4, N. Y. Sealed bids will be received in the office of the Engineering and Construction Director, Panama Canal Company, Balboa Heights, Canal Zone, until 10:00 AM E.S.T., January 27, 1954 at which time they will be formally opened, for preparation of site, clearing and grubbing, excavation, demolition, fills, backfills; installation of sanitary and storm sewers including structures, service lines and house connections, electrical distribution service conduits and conductors; construction of street pavements, curbs, and gutters, driveway and walk; construction of 63 houses complete. Project to be completed 300 calendar days after award. Plans and specifications may be obtained from Panama Canal Company, 24 State St., New York 4, N. Y. Requests should be accompanied by a $40.00 deposit for each set. Deposit should be made payable to "Treasurer, Panama Canal Company." Plans and specifications may be inspected at the following places: Panama Canal Company, 101 Indiana Ave., N. W. Washington 25, D. C.; Panama Canal Company, 24 State Street, New York 4, N. Y.; Office of the District Engineer, U. S. Engineer's Office, 1709 Jackson Street, Omaha 2, Nebraska; Office of the District Engineer, U. S. Engineer's Office, 180 New Montgomery Street, San Francisco 19, California; Office of the District Engineer, U. S. Engineer's Office, P. O. Box 1538, Albuquerque, New Mexico; Office of the District Engineer, U. S. Engineer's Office, 751 S. Figueroa Street, Los Angeles, California; Office of the Division Engineer, U. S. Engineer's Office, Southwestern Division, 1114 Commerce Street, Dallas, Texas; Office of the District Engineer, U. S. Engineer's Office, 4735 Marginal Way, Seattle 4, Washington; Office of the District Engineer, U. S. Engineer's Office, Foot of Prytania Street, New Orleans, Louisiana.

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OFFICIAL PROPOSALS

Bids: January 13, 1954

Construction of Two Anchorage Superstructures

DELAWARE RIVER PORT AUTHORITY
ADMINISTRATION BUILDING
CAMDEN, NEW JERSEY
ANCHORAGE SUPERSTRUCTURES

Schedule "A"—Philadelphia Anchorage Superstructure
Schedule "B"—Gloucester Anchorage Superstructure

Sealed bids will be received for the construction of Two Anchorage Superstructures for a Suspension Bridge over the Delaware River connecting Packer Avenue in Philadelphia, Pennsylvania and Gloucester City, New Jersey, known as Contract No. 3 at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 1:30 P. M. Eastern Standard Time, January 13, 1954, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

A proposal on Schedule "A" and or Schedule "B" must be accompanied by a certified check in the sum of One Hundred Thousand Dollars ($100,000.00) each payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company, having an office or place of business either in Philadelphia, Pennsylvania or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the Contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received, to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

COMMONWEALTH OF MASSACHUSETTS, Department of Public Works. NOTICE TO CONTRACTORS: Sealed proposals for State Highway & Bridge Construction on Auto Route 5 in the Towns of AGAWAM and WEST SPRINGFIELD will be received at Room 427, 100 Nashua Street, Boston, Mass., until 2:00 P.M. of Tuesday, January 12, 1954, and at that place and time publicly opened and read. Proposal guaranty: $72,000. Charge for plans and proposal forms: $25.00 amount returnable only to bidders. Complete information at said office; plans on display at District offices. Minimum wage and dump-truck rates have been established. Right reserved to waive any informality in or reject any or all proposals. An award will not be made to a Contractor who is not equipped to undertake and complete the work. By: JOHN A. VOLPE, Commissioner of Public Works. December 19, 1953.

OFFICIAL PROPOSALS

Bids: January 8, 1954

State Highway Construction

Sealed bids will be received by the State of Tennessee Department of Highways and Public Works at their Offices in the Cotton States Building, Nashville, Tennessee, until 10:00 o'clock A.M. January 8, 1954.

DAVIDSON COUNTY:

Project No. U-068-1-(1) Pt. III—The Construction of the superstructure for Victory Memorial Bridge over Cumberland River in Nashville, State Route No. 26.
Project Length—0.349 Miles
Working Days—250
(Unloading Point—Nashville)

Financial Equipment and Experience Questionnaires must be on file with the Department fifteen (15) days before the date of the letting.

No Proposals will be issued after 9:00 o'clock A.M. Friday, Jan. 8, 1954.

THE ATTENTION OF THE BIDDER IS DIRECTED TO CHAPTER 135, ACTS OF 1945.

Contractor must prequalify with the Department of Highways and Public Works in accordance with Chapter 80 of the Public Acts of 1929, before any proposals will be furnished. PROSPECTIVE BIDDERS MUST HAVE FILED THEIR QUESTIONNAIRES FOR QUALIFICATION FIFTEEN DAYS BEFORE THE DATE OF LETTING.

QUESTIONNAIRES WITHIN ONE YEAR OF JULY 1, 1953 OR LATER, WILL BE REQUIRED OF ALL PROSPECTIVE BIDDERS IN THIS LETTING.

Must be certified by a certified public accountant.

The right to reject any and all bids is reserved.

W. H. Leech
Commissioner

Bids: January 5, 1954

Contract 440

ELECTRIC CONDUCTORS, CABLES, ETC.

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, January 5, 1954, for Contract 440, for furnishing, testing and delivering approximately 82,000 feet of electric conductors and cables, power panelboards, safety switches and fuses, complete in every respect, in the numbers and sizes specified, for installation in the Neversink and East Delaware intake and outlet chambers and the Downsville release water chamber of the Delaware system, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of one thousand five hundred dollars ($1,500.00) for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety etc., can be obtained in Room 1316 at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

OFFICIAL PROPOSALS

U. S. Government

Bureau of Reclamation, North Platte River District—121753—P3, Casper, Wyoming, UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION, NOTICE IS HEREBY GIVEN that sealed bids on Invitation No. 7038-322 for furnishing and delivering distribution transformers and switching equipment for Gering Substation, Transmission Division, Nebraska, Missouri River Basin Project, will be mailed to P. O. Box 280, Casper, Wyoming or delivered to the office of the Bureau of Reclamation in time for the public opening at 2:00 p.m., Mountain Standard Time, January 19, 1954, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming. Copies of the standard forms and of the invitations may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, Building No. 46, Denver Federal Center, Denver, Colorado; and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge for copies of the invitations furnished for bidding purposes; for all others $0.25 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. DC-4096) will be received at Albuquerque, New Mexico, until January 20, 1954, for furnishing labor and materials for earthwork, clearing and structures for rehabilitation of drains, Unit BW-1, Middle Rio Grande Project, New Mexico. Location near Belen, New Mexico, Valencia County. Principal items are: Rehabilitation of approximately 24 miles of existing drains; excavation 27,000 cu. yds.; furnishing and laying 2600 lin. ft. corrugated metal pipe; constructing 3780 lin. ft. of drains with uncemented joints; and other work. Completion time 150 days. For particulars, address Bureau of Reclamation, Albuquerque, New Mexico; or Building 53, Denver Federal Center.

W. A. DEXHEIMER, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. DC-4097) will be received at Albuquerque, New Mexico, until January 28, 1954, for furnishing labor and materials for earthwork, clearing and structures for rehabilitation of drains, Unit BE-1, Middle Rio Grande Project, New Mexico. Location near Belen, New Mexico, Valencia County. Principal items are: Rehabilitation of approximately 38 miles of existing drains; excavation 27,350 cu. yds.; furnishing and laying 2650 lin. ft. corrugated metal pipe; and other work. Completion time 150 days. For particulars, address Bureau of Reclamation, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

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(Continued from opposite page)

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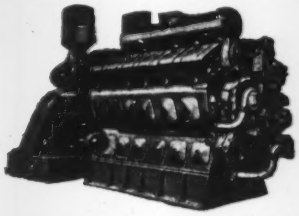

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18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
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FOR SALE

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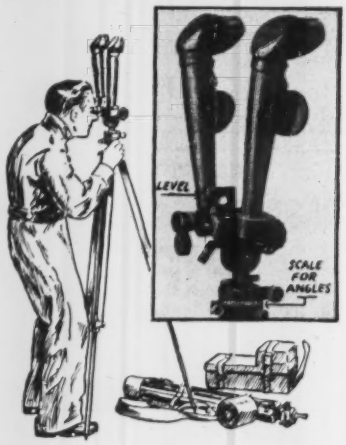

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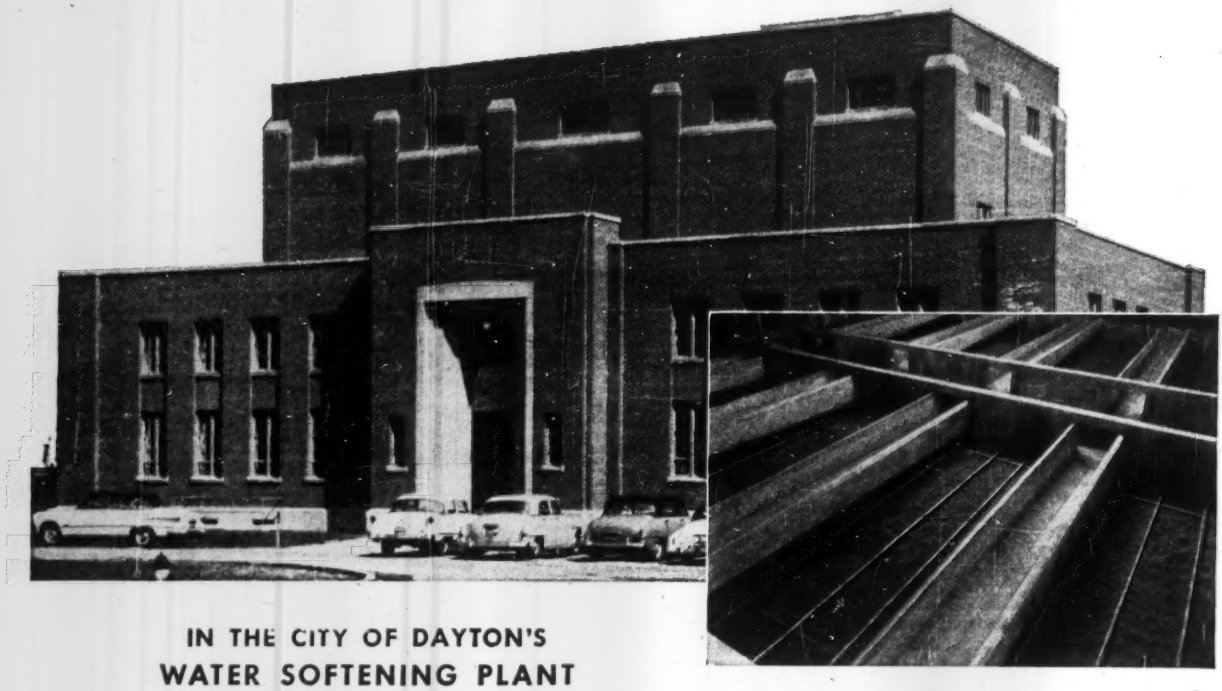

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WROUGHT IRON PIPE helps assure *long-life service...minimum maintenance*

Realizing that more than 240,000 people would depend daily on the uninterrupted service of this million-and-half dollar water softening plant, the designers took decisive steps to assure maximum protection against corrosion. In all wash water lines and process piping, 3-inch and smaller, wrought iron pipe was installed. The insert illustration above shows a portion of the surface wash water piping on the filter beds. Alvord, Burdick and Howson, Chicago, Illinois, were the architects and engineers. Johnson Brothers Heating Company, also of Chicago, was awarded the contract for the piping work.

Every engineer will recognize the corrosion hazard that is present in each of these services. And many engineers, from all sections of the country, can certify from personal experience how effective wrought iron pipe is in combating the conditions. In hundreds of reported installations, wrought iron pipe has doubled, tripled and even quadrupled the useful life previously obtained from low-first-cost piping materials.

The best guide in applying wrought iron pipe is not just a list of current uses, but an understanding of what wrought iron is, how it's made, and why it resists corrosion. This story is condensed in our booklet, "*The ABC's of Wrought Iron.*" We'll be happy to send you a copy.

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This notch-fracture test specimen illustrates the unique fibrous structure of wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glasslike silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

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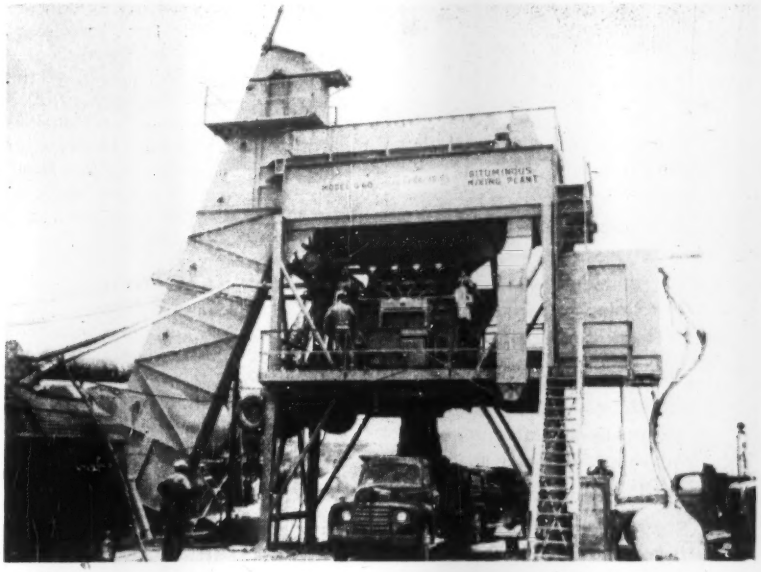
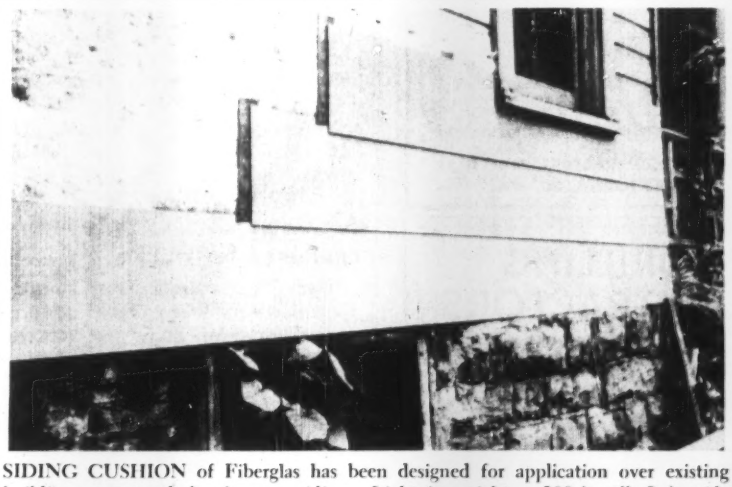


"Push button" bituminous mixing plant has 6,000-lb batch capacity

The Cedarapids line of bituminous mixing plants has been extended with the addition of the Model G-60, a 5,000 to 6,500-lb batch capacity unit with a 65-cu ft aggregate batcher and 60-cu ft mixing unit.

With the standard arrangement, the plant may be operated manually or semiautomatically with full pneumatic controls, or, under an optional setup, the equipment may be completely automatic and electronically controlled.

Electric time and sequence locking



SIDING CUSHION of Fiberglas has been designed for application over existing buildings as an underlay for new siding. Light in weight, a 200-ft roll, 2 ft wide and ½ in. thick, weighs only 12½ lb. The resilient blanket is made of inorganic fibers of glass and therefore is rot and fire resistant. While the small, compressed thickness reduces the thermal insulating value, the product has some effect as a heat barrier and reduces sound transmission. Owens-Corning Fiberglas Corp., Nicholas Bldg., Toledo 1, Ohio.

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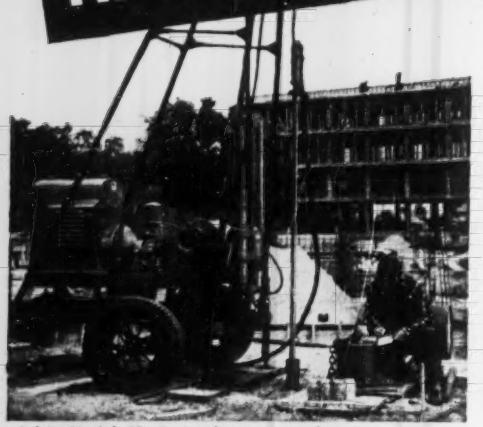

Acker Model TH Hydraulic Feed Core Drill mounted on two wheel trailer engaged in soil sampling and foundation test boring for a new building.

This Acker drill owned by a leading Southern University, is used not only for instructing engineering students, but commercial testing as well. In the latter capacity, it is in much demand by State governmental engineering departments for soil sampling and foundation test boring.

To see why Acker drills are preferred by leading engineers everywhere, write for Bulletin 30, ENR.

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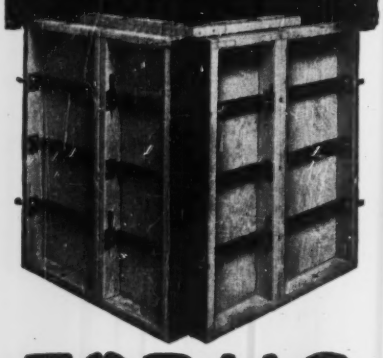

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systems control mixing time period, bitumen batcher gates, aggregate batcher gates and discharge gate of the mixing unit. Signal lights indicate each phase of the cycle and the operator has a view of the discharge gate at all times. According to the manufacturer, the closely controlled batching of the Model G-60 enables the contractor to change the type of specification mix with practically no delay—meaning that several types of mixes may be run the same day without loss of production time for operational changeover.

The base unit of the new mixing plant consists of the tower structure, enclosed hot elevator, a Cedarapids Model S 4x14-ft double-deck horizontal vibrating screen enclosed in a sheet metal dust housing, a 29-cu yd, four-compartment storage bin, twin-shaft mixer, aggregate batcher, bitumen batcher, bitumen pump unit and pneumatic controls with compressor.

Optional equipment includes, besides automatic electronic controls, a mineral filler attachment, extension for hot elevator and an extension for the hot storage bin. The last item increases bin capacity to 47 cu yds.

Plants may be driven by one central engine with power transmitted by chain, V-belt and other mechanical drives or, in an all electric unit, the various units may be driven by individual motors.

For portable applications, the mixing unit and screen-batcher unit are equipped with running gear with self-contained power erecting equipment to set up the tower structure and elevate the component units into operating position. For stationary applications, the units are furnished without the hinged tower structure column bases, running gear or power erecting equipment. Iowa Mfg. Co., 916 16th St. N.E., Cedar Rapids, Iowa.

Air compressor dump body combined for trucks

Two Ohio manufacturers have cooperated to produce a combination air compressor-dump body unit reported to be suitable for mounting on a wide range of standard motor trucks.

A Davey compressor delivers 105 cfm and is of two-stage air-cooled design. It occupies less than one-fourth of the truck body space and is driven direct from the truck engine by power take-off.

Constructed of high tensile steel, the Galion dump body is 90 in. long and 78 in. wide with 15-in. sides and 21-in. ends. Box type side braces, full-

size compressor protector and extra heavy rear corners are other features.

Raising and lowering is handled by a Galion model 700 hoist. GALION ALLSTEEL BODY CO., GALION, OHIO.

Slip-on pipe fittings speed pipe construction

Kee-Klamps. English-made structural pipe fittings, are now being imported and marketed through metal goods wholesalers in the U. S. Of the slip-on type, the fittings are used to erect permanent or temporary pipe structures such as racks, rails or scaffolds without welding or threading. Each pipe is held in the fitting by a cup-point, hex-socket screw.

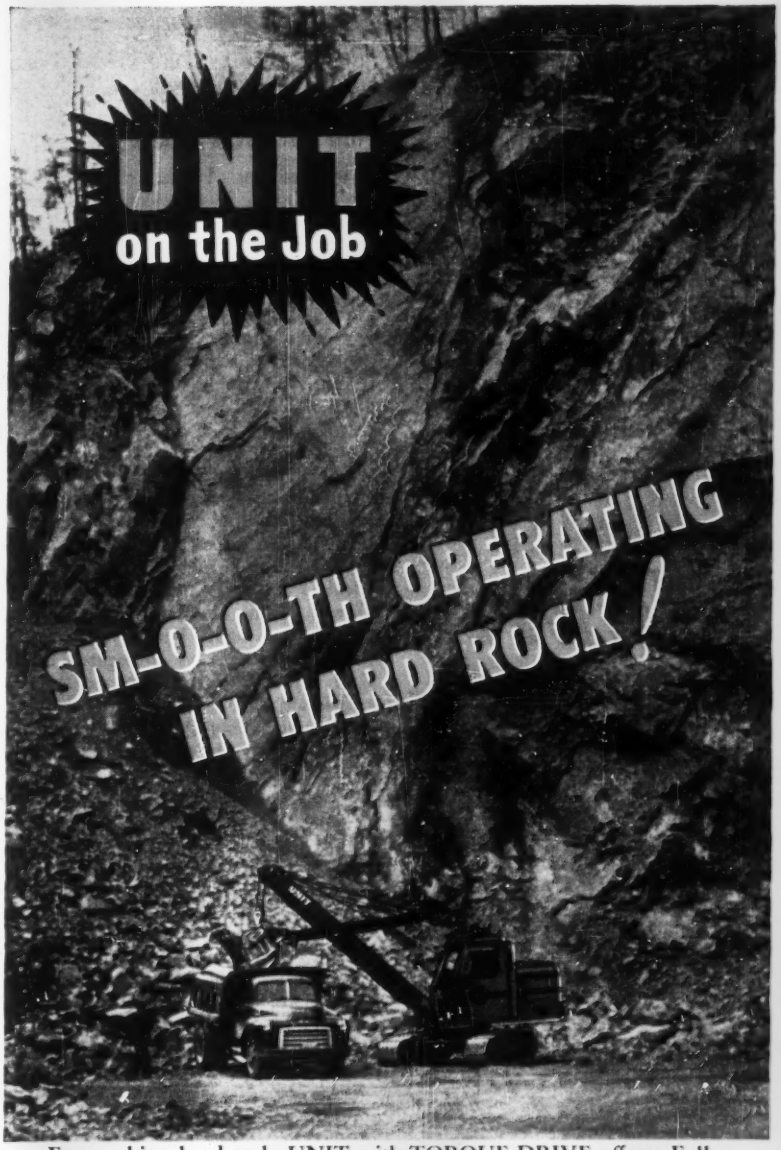
Available in both galvanied and black iron, the clamps are made in 44 basic fittings and 400 different patterns to fit all pipe from ⅜ in. to 2 in., inclusive; there are also reducing sizes. Bulletin 6-68 contains a list of types and sizes. KEE KLAMPS, BOX 99, HAMILTON, OHIO.

Portable automatic firing heating unit uses LP gas

Instant, odorless heat—up to 500,000 Btu's per hour—is the output reported for the automatically fired Eco-Temp portable heating unit.

LP gas is stored in tanks on the job with hose connections to the heater. According to the manufacturer, all the operator needs to do is plug-in and turn a valve and the unit goes into operation instantly. A flameproof vinyl-coated canvas heat duct can be furnished for directing the heat.

The new heater is available in three regular sizes—140,000, 250,000 and 500,000 Btu's per hour for all ordinary heating-drying-thawing operations. AR-



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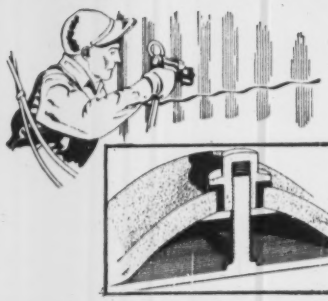

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NEW PRODUCTS

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New products briefs . . .

• **Hose selector**—A Wiretex rubber covered hydraulic hose selector has been prepared by the Republic Rubber Div, Lee Rubber & Tire Corp., Youngstown, Ohio. Starting with any known factor, such as the I.D., O.D., minimum burst, working pressure required or bend radius a designer or maintenance man can use the selector to determine the proper rubber covered hydraulic control hose for the operation on which the hose will be used.

• **Safety flashlights**—Two new industrial flashlights have been approved both by Underwriters Laboratories and the U. S. Bureau of Mines. The flashlights, manufactured by the Olin Electrical Div, 275 Winchester Ave., New Haven, Conn., are of solid drawn brass construction with barrels completely insulated with heavy corrugated fiber. End caps and lens rings are thickly cushioned against breakage with neoprene-type rubber. A circuit breaker instantly cuts contact with the batteries if the bulb is broken thereby preventing sparking. The 3-cell model is designated No. 3745 and the 2-cell model is No. 2745.

• **Power saw**—The new Power-Guide weighs 11½ lb. and will mitre a 2-in. plank at 45 deg. A shoe adjustment permits slotting from ¼ to 2⅞ in. deep. The product, manufactured by the Ram Tool Corp., 411 N. Claremont Ave., Chicago 12, Ill., has an air-cooled motor in an aluminum housing that delivers one full horsepower under peak load and a full 7-in. blade.

• **Diesel engine**—A new 2-cylinder diesel engine has been developed that is comparable with gasoline engines in size, weight and price. Designated the Model 17 the engine develops 20 hp at 2,000 rpm and will fit into any space 33 in. long, 22 in. wide and 31 in. high. A product of the R. H. Sheppard Co., Hanover, Pa., the engine is designed for installation as the auxiliary engine on mix-in-transit cement trucks and other equipment.

• **Sanding sealer**—A new sanding sealer for use as a first coat on most common woods that are to be finished is being manufactured by Minnesota Platon Corp., Pipestone, Minn. It is claimed that use of the product fills the open cells of the wood so that after light resanding it has a uniformly dense surface.

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PUBLICATIONS

Valves—Bulletin No. 1203 has been prepared to describe the functions of the new Simplex type AV combination air release and air inlet valve. Pictures of the valve in closed and open position, general description of the unit, discharge capacities, uses, weights and dimensions are included. The new valve is designed for the specific purpose of providing a small unit having the functions of releasing automatically air accumulations from systems, admitting air to systems for the purpose of breaking vacuums within them and venting large quantities of air when filling systems with water.—SIMPLEX VALVE & METER CO., 68TH & UPLAND STS., PHILADELPHIA 42, PA.

Cold-feed methods—A 16-page booklet illustrates a wide variety of cold-feed methods, adaptable to all makes of bituminous plants, regardless of type or manufacture. Not a simple listing of a manufacturer's products, the booklet makes engineering recommendations on the scope and advantages of many types of feed systems; recommendations that should be of assistance to operators of all types of mixing plant equipment. Featured is Barber-Greene's new series of wheel-mounted four-bin feeders that are said to provide accurate proportioning of the aggregate before drying. Many other types of feeding equipment are shown and their capacities are specified. Among these units are portable and stationary two, three and four-bin hoppers; apron, belt and reciprocating feeders; belt conveyors, both portable and in permanent installations; tunnel conveyor systems and car unloading equipment. Write for Bulletin CS, BARBER-GREENE CO., 400 N. HIGHLAND AVE., AURORA, ILL.

Steel light poles—A new 14-page catalog contains specifications of the standard anchor base and transformer base steel light poles and brackets as well as details on important features. Cutaway and exploded views give a comprehensive picture of component parts together with erection data for the purchasing agent, architect, engineer or installation crew. The catalog provides a detailed description of how mounting heights and bracket lengths may be varied to fit the individual requirements of the purchaser, with additional information on feeder arms, festoon outlets, hand holes and other modifications and accessories.—PACIFIC CAR & FOUNDRY CO., LIGHT POLE DIV., RENTON, WASH.

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EDITORIALS

New building code approach needed

THE WIDE RANGE in building code requirements for skyscraper wall construction revealed by an ENR survey last week (Dec. 24, p21) is typical of the variations in other building code regulations from one city to another. Engineers and architects who have designed structures for different cities are well aware of this. So are building officials whose representatives have been at work with the Joint Committee on Building Codes for four years in an attempt to reconcile these differences.

This group is trying to unify competing model codes section by section—unfortunately with little progress to date. Yet it is important that building code requirements be made as uniform as possible throughout the country.

The differences in the regulations of various cities, as well as in model codes, make it clear that code writers are not agreed on the degree of safety the law should require. Some of the disagreement apparently stems from failure to utilize data on the behavior of materials or equipment that became available after original adoption of a code. Some is due merely to inertia —lack of time, money or interest on the part of those responsible for preparing building regulations. Some can be explained only by the assumption that certain building officials, motivated by pride in their region or society, or influenced by pressure groups, find it advantageous to be uncooperative.

The Southern Building Code Congress, for example, won't participate in the Joint Committee on Building Codes. The Pacific Coast Building Officials Conference and the Building Officials Conference of America, though active on the committee, have not adopted any of its recommended unified sections. Adding further to the confusion, the Midwest Conference of Building Officials and Inspectors has just begun to write a model code of its own.

This situation makes it evident that a different approach is needed to dispel the inconsistencies in building codes. One suggestion is that architects and engineers assume more important roles in this task. The national professional societies, for example, could do a great deal to help the Joint Committee on Building Codes, not only by providing technical assistance when needed, but also by promoting general acceptance of its recommendations. To this end, building code committees of the local chapters of these societies could work at local levels for the adoption of the unified sections of the model codes. By acting on both national and local levels, architects and engineers, cooperating with the other groups concerned, might be able to bring this building code confusion to an end.

There are perhaps other ways in which the present loose ends of building code modernization and uniformity can be drawn together. But regardless of the method, the need becomes greater every day. Substantial savings in construction costs are slipping away while the code writers fail to agree.

Free versus toll bridges

AN INTERESTING QUESTION concerning the rights of users of a free bridge to continuation of that service has been raised in connection with plans to take down an old bridge over the Delaware River between Portland, Pa., and Columbia, N. J. Having completed a new toll bridge on a relocation of U. S. Highway 611 a short distance below the old bridge, the Delaware River Joint Toll Bridge Commission proposed to pull down the old one. That step is opposed by the local people, who state that the new bridge is less convenient for them, and that as the old bridge is sound and adequate it should be maintained as a free bridge.

So far they have been successful. The U. S. District Court at Trenton has granted them a stay of execution of the commission's plan. In their plea to the court the citizens' association claimed that the laws setting up the joint commission did not give it powers to demolish a free bridge and replace it with a toll bridge. The commission claims that if the free bridge is kept in service tolls on the new bridge will be insufficient to pay off its bonds.

Doubtless the questions raised by the citizens' association will be settled on the basis of powers granted the commission in the legislation passed by the two states when it was set up. On the other hand, in the light of what has happened farther down the river where there is one toll bridge and one free bridge between Phillipsburg, N. J., and Easton, Pa., the commission could bow to the wishes of the local people and keep the 100-yr.-old bridge in service for the remainder of its useful life.

At Easton, their toll bridge was placed on a relocation of U. S. 22 that avoids all the congestion on approaches to the old bridge through Phillipsburg and the worst part of Easton's traffic. As a result, not only does most through traffic use the toll bridge, but many of the local people are willing to pay the small toll on the new bridge for the time it saves them.

One lesson toll highways have taught is that the average motorist will quite gladly pay a reasonable toll to save time or keep out of congestion. Toll-highway experience also has shown that the actual traffic generally is above estimates. Hence, the new bridge can be expected to produce a higher income than predicted. Consequently, even though the commission does establish its right to pull down the old free bridge, it could afford to delay that action long enough to see what effect that bridge will have on tolls from the new structure.

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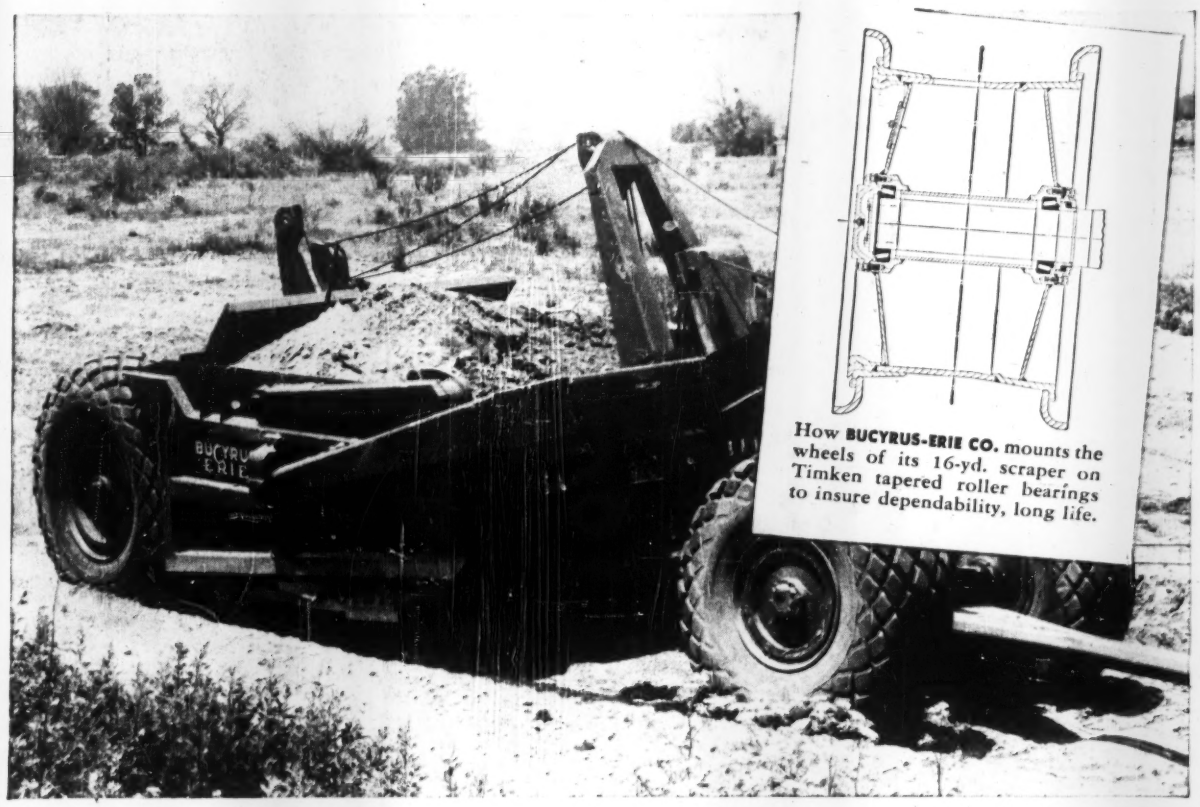

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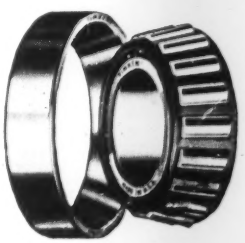

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